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## December 2018 Competitive Oil and Gas Lease Sale RPFO

Environmental Assessment

DOI-BLM-NM-A010-2018-0042-EA

### Location:

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**December 2018 Competitive Oil and Gas Lease Sale**  
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**1.0 INTRODUCTION**

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920 (MLA), as amended [30 U.S.C. 181 et seq.], and the Federal Land Policy and Management Act of 1976 (FLPMA), as amended, to make mineral resources available for disposal and to manage for multiple resources which include the development of mineral resources to meet national, regional, and local needs.

The BLM New Mexico State Office (NMSO) conducts a quarterly competitive lease sale to offer available oil and gas lease parcels in New Mexico, Oklahoma, Texas, and Kansas. A Notice of Competitive Lease Sale (NCLS), which lists lease parcels to be offered at the auction, is published by the NMSO at least 90 days before the auction is held. Lease stipulations applicable to each parcel are specified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations are necessary, based on information available at the time, is made during the land use planning process. Surface management of non-BLM administered land overlaying Federal minerals is determined by the BLM in consultation with the appropriate surface management agency or the private surface owner.

In the process of preparing a lease sale the NMSO sends a draft parcel list to any field offices in which parcels are located. Field office staff then review the legal descriptions of the parcels to determine if they are in areas open to leasing; if new information has become available which might change any analysis conducted during the planning process; if appropriate consultations have been conducted; what appropriate stipulations should be included; and if there are special resource conditions of which potential bidders should be made aware. The parcels nominated for this sale, along with the appropriate stipulations from the Resource Management Plan (RMP), are posted online for a three week public scoping period. Comments received are reviewed and incorporated into the environmental assessment (EA).

Once the draft parcel review is completed and returned to the NMSO, a list of nominated lease parcels with specific, applicable stipulations is made available online to the public through ePlanning. On rare occasions, additional information obtained after the publication to ePlanning may result in deferral of certain parcels prior to the lease sale.

This EA documents the BLM's review of the 30 parcels nominated for the December 2018 Competitive Oil and Gas Lease Sale that involve public lands administered by the Rio Puerco Field Office. It serves to verify conformance with the approved land use plan as well as demonstrates the effectiveness of attaching the lease stipulations to specific parcels.

The nominated parcel list was posted online for a three-week public scoping period starting on July 9, 2018.

## 1.1 Purpose and Need

The purpose is to provide opportunities for private individuals or companies to explore for and develop oil and gas resources on public lands through a competitive leasing process.

The need of the action is established by the BLM's responsibility under the Mineral Leasing Act (MLA), as amended, to promote the exploration and development of oil and gas on the public domain. The MLA also establishes that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with the Federal Land Policy Management Act (FLPMA), the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 et seq.), and other applicable laws, regulations, and policies.

## 1.2 Decision to be Made

The BLM will decide whether or not to lease the nominated parcels and, if so, under what terms and conditions.

## 1.3 Plan Conformance

The applicable land use plan for this action is the 1986 Rio Puerco Resource Management Plan (RMP), as amended. The 1986 RMP designated approximately 1.3 million acres of federal minerals open for fluid mineral leasing with moderate constraints, which include seasonal timing limitations and other controlled surface use stipulations designed to minimize or alleviate potential impacts to special resource values. Since the parcels under consideration fall within this area and the applicable constraints identified in the RMP would be attached to the parcels, if leased, leasing the parcels would be in conformance with the Rio Puerco RMP. Leasing the parcels would also be consistent with the RMP's goals and objectives for natural and cultural resources.

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this EA is tiered to and incorporates by reference certain information and analyses contained in the 1986 Rio Puerco RMP and its Final Environmental Impact Statement (EIS) as amended. The Final Resource Management was approved by the Record of Decision (ROD) signed January 1986. The RMP designated approximately 7.84 million acres of federal minerals open for continued oil and gas development and leasing under Standard Terms and Conditions. The RMP described specific stipulations that would be attached to new leases offered in certain areas.

In addition, FLPMA established guidelines to provide for the management, protection, development, and enhancement of public lands (Public Law 94-579). Section 103(e) of FLPMA defines public lands as any lands and interest in lands owned by the U.S. For split-estate lands

where the mineral estate is an interest owned by the U.S., the BLM has no authority over use of the surface by the surface owner; however, the BLM is required to declare how the federal mineral estate will be managed in the RMP, including identification of all appropriate lease stipulations (43 CFR 3101.1 and 43 CFR 1601.0-7(b); BLM Manual Handbook 1601.09 and 1624-1).

Site specific analysis as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 et seq.) (8) was conducted by Rio Puerco Field Office resource specialists who relied on personal knowledge of the areas involved and/or reviewed existing databases and file information to determine if appropriate stipulations had been attached to specific parcels.

If a nominated lease parcels is sold, it is unknown when, where, or if future well sites or roads might be proposed. Also, at the time of this review, it is unknown whether a parcel will be sold and a lease issued. Analysis of projected surface disturbance impacts, should a lease be developed, was estimated based on potential well densities listed in the Reasonable Foreseeable Development Scenario used as the basis for the PRMP/FEIS. Detailed site specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD).

The proposed project would not be in conflict with any local, county, or state plans.

#### 1.4 Scoping and Issues

An internal review of the Proposed Action was conducted by an interdisciplinary team of Rio Puerco Field Office resource specialists on July 2, 2018 to identify and consider potentially affected resources and associated issues—the scope of issues evaluated in this EA—presented below. The outcome of this meeting and subsequent review by the resource specialists was the identification of applicable lease stipulations that are appropriately applied to each respective parcel.

The parcels included in the Proposed Action, along with the appropriate stipulations from the RMP, were posted online at <https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=110287&dctmId=0b0003e881163d8d>. More information can be found under the documents tab.

In addition, appropriate consultations were initiated with Native American tribes and pueblos to solicit input on the proposed lease sale and any potential unresolved issues.

#### 1.5 Resource Issues Identified

257 1.5.1 Areas of Critical Environmental Concern

258 What are the:

- 259 • Potential to adversely affect the Torreon Fossil Fauna ACEC.

260 1.5.2 Recreation and Special Designation Areas

261 What is the:

- 262 • Potential to adversely affect Oh My God 100 Courses A, B, and C?

263 1.5.3 Wildlife

264 What are the:

- 265 • Potential impacts to big game winter range?  
266 • Potential impacts to Habitat Stamp Program projects in the area (i.e., wildlife waters,  
267 riparian enclosures, prescribed vegetation treatments)?  
268 • Potential impacts to sagebrush obligate birds?

269 1.5.4 Special Status Species

270 What are the:

- 271 • Potential impacts to rare plants (*Sclerocactus cloverae* (Clover's cactus, formally known  
272 as Brack's cactus), *Alicellia formosa*, and *Asclepias sanjuanensis*)?  
273 • Potential impacts to the Gunnison's prairie dog (*Cynomys Gunnisoni*)

274 1.5.5 Cultural Resources

275 What is the:

- 276 • Potential to adversely affect National Register eligible sites?  
277 • Potential to adversely affect or restrict Native American access to Traditional Cultural  
278 Properties?

279 1.5.6 Mineral Resources

280 What is the:

- 281 • Need for development of energy mineral resources?  
282 • Potential to affect the disturbed land by development of the lease?

283 1.5.7 Paleontological Resources

284 What is the:



- 285       • Potential to impact significant paleontological resources?

286                   1.5.8   Soils

287   What is the:

- 288       • Potential for accelerated soil erosion on steeper slopes?  
289       • Potential for poor reclamation success (revegetation) on certain soils if disturbed?

290                   1.5.9   Livestock Grazing

291   What is the:

- 292       • Potential to impact livestock grazing operations?

293                   1.5.10   Vegetation

294   What is the:

- 295       • Potential to disrupt and remove native/desirable vegetation?

296                   1.5.11   Noxious Weeds and Invasive, Non-native Species

297   What is the:

- 298       • Potential to introduce and propagate noxious weeds and other invasive, non-native  
299       species?

300                   1.5.12   Watershed Resources

301   What is the:

- 302       • Potential to affect watershed stability and associated resources such as riparian areas,  
303       wetlands, and floodplains?  
304       • Potential to affect surface and ground water quality?  
305       • Potential to affect water drawdown to RFD?

306                   1.5.13   Areas of Human Occupancy and Development

307   What is the:

- 308       • Potential to impact land uses by local populations?  
309       • Potential to disproportionately impact minority or low income populations  
310       (Environmental Justice)?

311                   1.5.14   Air Resources

312   What is the:

- Potential for emissions of criteria and hazardous air pollutants?
- Potential for contributions to climate change?

#### 1.6 Issues not Analyzed

The following elements are not present in the nominated parcel areas therefore there would be no potentially significant effects related to the issues resulting from any of the alternatives presented below: Prime or Unique Farmlands, Wild and Scenic Rivers, Wilderness, Wilderness Study Areas, Wild Horses and Burros, and CDT.

**Table 1.1 Issues Not Analyzed In Further Detail Within The Environmental Analysis.**

Issue	ISSUES NOT RETAINED FOR FURTHER ANALYSIS WITHIN THE EA
Potential to impacts Solid Mineral Resources?	A data review indicated interest for solid minerals is very low within the proposed lease parcels.
Potential impacts to Woodland and Forestry resources?	Effects cannot be predicted until the site-specific APD stage of development. During the APD stage a site specific analysis will occur.
Potential impacts to Lands and Realty Authorizations?	Effects cannot be predicted until the site-specific APD stage of development. During the APD stage a site specific analysis will occur.
Potential impacts to Visual Resources?	Project area is outside of designated visual resource management, but was inventoried as Visual Resource Inventory Class IV. The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. For VRM Class IV, all facilities, including meter buildings, would be painted a BLM standard color determined by the Authorized Officer at

Issue	ISSUES NOT RETAINED FOR FURTHER ANALYSIS WITHIN THE EA
	the time of development to blend with the rolling to flat vegetative and/or landform setting. The proposed project would have little to no effect on this resource.

## 1.7 Reasonably Foreseeable Development Scenario

Although at this time it is unknown when, where, or if future well sites or roads might be proposed on any leased parcel, should a lease be issued site specific analysis of individual wells or roads would occur when a lease holder submits an APD (Application for Permit to Drill). The Reasonably Foreseeable Development Scenario (RFDS) within the 1991 Albuquerque District RMP EIS serves as an analytical baseline for identifying and quantifying direct, indirect, and cumulative effects of oil and gas activity and forms the foundation for the analysis of the effects of oil and gas management decisions in planning and environmental documents. The RFDS projected three to five wells would be drilled annually in the planning area over the 15 to 20 year life of the RMP. The APD trend over that time frame confirms the 1991 RMP assumptions are still valid. Because of the recent low rate of drilling and production it is projected that one to three wells per lease would be drilled, and that the majority of the wells would produce oil. With 30 proposed leases, the estimated actual surface disturbance would be approximately 360 acres. The following sections provide a general discussion of possible post-leasing RFD activities. All of these activities would require additional NEPA review (See Table 4.4).

### 1.7.1 Well Pad and Road Construction

Equipment for well pad construction would consist of dozers, trackhoes, and graders. All well pads would be reclaimed. Topsoil from each well pad would be stripped to a minimum depth of six inches and stockpiled for future reclamation. Interim reclamation of the pad would occur if the well produces commercial quantities of oil or gas. Interim reclamation involves a reduction of the drill pad to a size that accommodates the functions of a producing well. The topsoil would be spread over the interim reclamation area, seeded, left in place for the life of the well, and then used during the final reclamation process. If the well is not productive final reclamation of the pad and constructed road would begin. Disturbance for each well pad would be estimated at an area of approximately four acres of land, including topsoil piles. Disturbed land would be seeded with a mixture (certified weed free) and rate as recommended or required by the BLM.

Depending on the locations of the proposed wells, it is anticipated that some new or upgraded access roads would be required to access well pads and maintain production facilities. Any new roads constructed for the purposes of oil and gas development would be utilized year-round for maintenance of the proposed wells and other facilities, and for the transportation of fluids and/or equipment, and would remain open to other land users. Construction of new roads or upgrades to existing roads would require a 12-24 foot travel way width and would be constructed of native

material. It is not possible to determine the distance of road that would be required because the location of the wells would not be known until the APD stage. However, for purposes of analyses it is assumed that disturbance from access roads would be approximately 8 acres (2 miles of road at 4 acres per mile) per well site.

#### 1.7.2 Well Drilling and Completion Operations

A drilling rig would be transported to the well pad (along with other necessary equipment). Drilling would commence with well spud. Typical drilling operations would include: adding joints of drill pipe at the surface as the hole deepens; circulating drilling fluids to cool the drill bit and remove the drill cuttings; pulling the drill pipe from the hole to replace worn drill bits; and setting strings of casing and cementing them in place. Air and/or water-based drilling fluid may be used to drill the hole. Prior to setting the production casing, open-hole well logs may be run to identify potentially productive horizons. If the evaluation concludes that sufficient natural gas and/or oil are present and recoverable, steel production casing would be installed and cemented in place. Drilling activities on a well would typically occur 24 hours per day, seven days per week, and would require approximately 20 workers. It could require from two to four weeks to drill a well depending on the depth and complexity of the well.

Once a well has been drilled and evaluated to have sufficient oil and/or natural gas, completion operations would begin. Well completion involves perforating the production casing in target zones, followed by hydraulic fracturing (fracking) of the formation. Fracking operations include injecting an agent (e.g., water, gel, liquid, carbon dioxide, and/or nitrogen) into the formation under pressure. The fracking agent would likely contain sand or other proppant material to keep the fractures from closing, thereby allowing fluids to be produced from the formation. The next phase of completion would be to flow and test the well to determine rates of production.

Typical equipment and vehicles used during completion activities might include carbon dioxide tanker trucks; sand transport trucks; water trucks; oil service trucks used to transport pumps and equipment for fracking; flat beds and gin trucks to move water tanks, rigs, tubing, and fracking chemicals; logging trucks (cased hole wireline trucks); pickup trucks to haul personnel and miscellaneous small materials; and workover rigs.

Completion activities on individual wells may occur 24 hours per day, seven days per week, and would require approximately 20 to 40 workers. Completion of an individual well could take from 7 to 30 days, depending on the number of completion zones.

#### 1.7.3 Hydraulic Fracturing

Hydraulic fracturing (HF) is a well stimulation technique used to increase oil and gas production from underground rock formations. As summarized below, HF technology is not used on all wells drilled in the RPFO. As a result, HF will be evaluated at the APD stage should the lease parcel be sold/issued, and a development proposal submitted. The following paragraphs provide a general discussion of the

The HF process that could potentially be implemented if development were to occur, including well construction information and general conditions encountered within the RPFO. HF involves the injection of fluids through a wellbore under pressures great enough to fracture the oil and gas producing formations. The fluid is generally comprised of a liquid such as oil, carbon-dioxide or nitrogen, and proppant (commonly sand or ceramic beads), and a minor percentage of chemicals to give the fluid desirable flow characteristics, corrosion inhibition, etc. The proppant holds open the newly created fractures after the injection pressure is released. Oil and gas flow through the fractures and up the production well to the surface.

HF has been used by oil and natural gas producers since the late 1940s and, for the first 50 years, was mostly used in vertical wells in conventional formations. HF is still used in these settings, but the process has evolved. Technological developments (including horizontal drilling) have led to the use of HF in “unconventional” hydrocarbon formations that could not otherwise be profitably produced.

The use of horizontal drilling through unconventional reservoirs combined with high-volume water based multi-stage HF activities has led to an increase in oil and gas activity in several areas of the country which has, in turn, resulted in a dramatic increase in domestic oil and gas production nationally. However, along with the production increase, HF activities are suspected of causing contamination of fresh water by creating fluid communication between oil and gas reservoirs and aquifers. The EPA recently conducted an assessment of HF on drinking water resources (<https://www.epa.gov/hfstudy>).

Hydraulic fracturing uses between 1.2 and 3.5 million gallons of water per well, with large projects using up to 5 million gallons. One major problem for the industry is where to find this source water.

There are presently no unconventional reservoirs in the Rio Puerco Field Office that are being exploited using high-volume water based or any other type of HF techniques.

#### 1.7.4 Production Operations

If wells were to go into production, facilities would be located at the well pad and typically include a well head, a dehydrator/separator unit, and storage tanks for produced fluids. The production facility would typically consist of two storage tanks, a truck load-out, separator, and dehydrator facilities. Construction of the production facility would be located on the well pad and not result in any additional surface disturbance.

All permanent surface structures would be painted a flat, non-reflective color specified by the BLM in order to blend with the colors of the surrounding natural environment. Facilities that are required to comply with the Occupational Safety and Health Act (OSHA) would be excluded from painting color requirements. All surface facilities would be painted immediately after installation and under the direction and approval of the BLM.

All operations would be conducted following the “Gold Book”, Surface Operating Standards for Oil and Gas Exploration and Development. The Gold Book was developed to assist operators by providing information on the requirements for conducting environmentally responsible oil and gas operations on federal lands. The Gold Book provides operators with a combination of guidance and standards for ensuring compliance with agency policies and operating requirements, such as those found at 43 CFR 3000 and 36 CFR 228 Subpart E; Onshore Oil and Gas Orders (Onshore Orders); and Notices to Lessees. Included in the Gold Book are environmental BMPs; these measures are designed to provide for safe and efficient operations while minimizing undesirable impacts to the environment.

#### 1.7.5 Produced Water Handling

Water is often associated with either produced oil or natural gas. Water is separated out of the production stream and can be temporarily stored in the reserve pit for 90 days. Permanent disposal options include discharge to evaporation pits or underground injection. Handling of produced water is addressed in Onshore Oil and Gas Order No. 7, which prescribes measures required for the protection of surface and ground water sources.

#### 1.7.6 Maintenance Operations

Traffic volumes during production would be dependent upon whether the wells produced natural gas and/or oil, and for the latter, the volume of oil produced. Well maintenance operations may include periodic use of work-over rigs and heavy trucks for hauling equipment to the producing well, and would include inspections of the well by a pumper on a regular basis or by remote sensing. The road and the well pad would be maintained for reasonable access and working conditions. Portions of the well pad not needed for production of the proposed well, including the reserve pit, would be re-contoured and reclaimed, as an interim reclamation of the site.

#### 1.7.7 Plugging and Abandonment

If the wells do not produce economic quantities of oil or gas, or when it is no longer commercially productive, the well would be plugged and abandoned. The wells would be plugged and abandoned following procedures approved by a BLM Petroleum Engineer, which would include requiring cement plugs at strategic positions in the well bore. All fluids in the reserve pit would be allowed to dry prior to reclamation work. After fluids have evaporated from the reserve pit, sub-soil would be backfilled and compacted within 90 days. If the fluids within the reserve pit have not evaporated within 90 days (weather permitting or within one evaporation cycle, i.e. one summer), the fluid would be pumped from the pit and disposed of in accordance with applicable regulations. The well pad would be re-contoured, and topsoil would be replaced, scarified, and seeded within 180 days of the plugging the well

## 2.0 PROPOSED ACTION AND ALTERNATIVES

464

465           2.1 Proposed Action

466   The Proposed Action is to lease the 30 parcels nominated parcels of federal minerals, covering  
467   approximately 41,000 acres administered by the Rio Puerco Field Office, for oil and gas  
468   exploration and development. A complete description of these parcels, is provided in Appendix  
469   2.

470   Once sold, the lease purchaser has the exclusive right to use so much of the leased lands as is  
471   reasonably necessary to explore and drill for all of the oil and gas within the lease boundaries,  
472   subject to the stipulations attached to the lease (43 CFR 3101). Oil and gas leases are issued for a  
473   10-year period and continue for as long thereafter as oil or gas is produced in paying quantities.  
474   If a lease holder fails to produce oil and gas, does not make annual rental payments, does not  
475   comply with the terms and conditions of the lease, or relinquishes the lease, exclusive right to  
476   develop the leasehold reverts back to the federal government and the lease can be reoffered in  
477   another lease sale.

478   Oil and gas leases are issued for a 10-year period and continue for as long thereafter as oil or gas  
479   is produced in paying quantities. If a lessee fails to produce oil and gas, does not make annual  
480   rental payments, does not comply with the terms and conditions of the lease, or relinquishes the  
481   lease; exclusive right to develop the lease reverts back to the federal government and the lease  
482   can be reoffered in another lease sale. Drilling of wells on a lease is not permitted until the lease  
483   owner or operator secures approval of a drilling permit and a surface use plan specified under  
484   Onshore Oil and Gas Orders listed in Title 43 Code of Federal Registration 3162. A permit to  
485   drill would not be authorized until site-specific NEPA analysis is conducted

486   Drilling of wells on a lease is not permitted until the lease owner or operator secures approval of  
487   a drilling permit and a surface use plan specified under Onshore Oil and Gas Orders listed in  
488   Title 43 CFR 3162. A permit to drill would not be authorized until site-specific NEPA analysis  
489   is conducted.

490

491           2.2 - No Action Alternative

492   The BLM NEPA Handbook (H-1790-1) states that for EAs on externally initiated proposed  
493   actions, the no action alternative generally means that the proposed action would not take place.  
494   In the case of a lease sale, this would mean that an expression of interest to lease (parcel  
495   nomination) would be deferred, and the 30 parcels would not be offered for lease during the  
496   December 2018 Competitive Oil and Gas Lease Sale. Surface management and any ongoing oil  
497   and gas development on surrounding federal, private, and state leases would continue under  
498   current guidelines and practices. Selection of the no action alternative would not preclude these  
499   parcels from being nominated and considered in a future lease sale.

500   **Table 2.1 Summary of Parcels and Stipulations**

Parcel	Stipulations
<b>NM-201812-072      2005.950 Acres</b> T.0200N, R.0040W, 23 PM, NM Sec. 001 LOTS 1-4; 001 S2N2,S2; 002 S2N2SW,S2SW,S2NWSE,N2SWSE 011 ALL; 012 ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-073      2080.000 Acres</b> T.0200N, R.0040W, 23 PM, NM Sec. 013 ALL; 014 E2; 023 ALL; 024 N2,SW;	RP # 6 National Register of Historic Places  RP # 10 No Surface Occupancy Contains a Church or Cemetery T. 20N, R. 04W, Sec. 14, E ½ of the SE ¼ of the NE ¼  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-074      792.920 Acres</b> T.0200N, R.0040W, 23 PM, NM Sec. 017 N2; 018 LOTS 1-4 018 NE,E2W2; 018 LESS S2SESENE;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-075      640.000 Acres</b> T.0200N, R.0040W, 23 PM, NM Sec. 019 NE; 020 N2; 021 NW;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-076      1424.620 Acres</b> <b>T. 0200N, R. 0040W, 23 PM, NM</b> Sec. 019 LOTS 3,4; 019 E2SW; 030 LOTS 1-4; 030 E2, E2W2; 031 LOTS 1-4; 031 E2, E2W2;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN



<p><b>NM-201812-077      2560.000 Acres</b>  T.0200N, R.0040W, 23 PM, NM  Sec. 025 ALL;  026 ALL;  035 ALL;  036 ALL;</p>	<p>RP # 6 National Register of Historic Places   RP # 3 No Surface Occupancy - Cultural Resources and Aviation Facilities and NM 11-LN Special Cultural Resource- T. 20N, R. 04W, Sec. 35, SW ¼   WO-ESA-7-Endangered Species Act   WO-NHPA-National Historic Preservation Act   NM-1-LN</p>
<p><b>NM-201812-078      1280.000 Acres</b>  T.0200N, R.0040W, 23 PM, NM  Sec. 027 ALL;  028 NW,S2;  029 SE;</p>	<p>RP # 6 National Register of Historic Places   WO-ESA-7-Endangered Species Act   WO-NHPA-National Historic Preservation Act   NM-1-LN</p>
<p><b>NM-201812-079      800.000 Acres</b>  T.0200N, R.0040W, 23 PM, NM  Sec. 033 S2;  034 W2,SE;</p>	<p>RP # 6 National Register of Historic Places   RP # 3 No Surface Occupancy - Cultural Resources and Aviation Facilities and NM 11-LN Special Cultural Resource- T. 20N, R. 04W, Sec. 34, SE ¼ and NW ¼   WO-ESA-7-Endangered Species Act   WO-NHPA-National Historic Preservation Act</p>
<p><b>NM-201812-080      2041.680 Acres</b>  T.0210N, R.0040W, 23 PM, NM  Sec. 001 E2SE,SWSE;  002 LOTS 1-4;  002 S2N2,S2;  011 ALL;  012 ALL;</p>	<p>RP # 6 National Register of Historic Places   WO-ESA-7-Endangered Species Act   WO-NHPA-National Historic Preservation Act</p>

<b>NM-201812-081      2459.040 Acres</b> T.0210N, R.0040W, 23 PM, NM Sec. 003   LOTS 5-8; 003   S2N2,S2; 004   LOTS 5-8; 004   S2N2,S2; 009   ALL; 010   ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-082      2433.020 Acres</b> T.0210N, R.0040W, 23 PM, NM Sec. 005   LOTS 5-8; 005   S2N2,S2; 006   LOTS 8-14; 006   S2NE,SE,SE,SE; 007   LOTS 1-4; 007   E2,E2W2; 008   ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-083      1680.000 Acres</b> T.0210N, R.0040W, 23 PM, NM Sec. 013   N2,W2SW; 014   ALL; 023   ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-084      1923.760 Acres</b> T.0210N, R.0040W, 23 PM, NM Sec. 018   LOTS 1-4; 018   E2,E2W2; 019   LOTS 1-4; 019   E2,E2W2; 020   ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-085      1280.000 Acres</b> T.0210N, R.0040W, 23 PM, NM Sec. 021   ALL; 022   ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN

<b>NM-201812-086      480.000 Acres</b> T.0210N, R.0040W, 23 PM, NM Sec. 025 E2,SW;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-087      1680.000 Acres</b> T.0210N, R.0040W, 23 PM, NM Sec. 027 W2,N2SE; 028 ALL; 029 ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-088      961.880 Acres</b> T.0210N, R.0040W, 23 PM, NM Sec. 030 LOTS 1-4; 030 E2,E2W2; 031 E2;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-092      1279.840 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 001 LOTS 1-4; 001 S2N2,S2; 012 ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-093      320.000 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 002 SW; 003 SE;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-094      161.060 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 004 LOTS 1-2; 004 S2NE;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN

<b>NM-201812-095      958.200 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 005 LOTS 1,2; 005 S2NE,S2; 006 LOTS 3-7; 006 SENW,E2SW,SE;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-096      800.000 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 008 S2; 009 E2,SW;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-097      1280.000 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 010 ALL; 011 ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-098      1920.000 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 013 ALL; 014 ALL; 015 ALL;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act
<b>NM-201812-099      1440.400 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 017 E2,NW; 018 LOTS 3-4; 018 E2SW,SE; 019 LOTS 3,4; 019 NE,E2SW; 020 E2;	RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN

<p><b>NM-201812-100      2400.000 Acres</b>  T.0210N, R.0050W, 23 PM, NM  Sec. 023 ALL;  024 ALL;  025 ALL;  026 W2,SE;</p>	<p>RP # 5 Designated Area of Critical Environmental Concern</p> <p>Paleontology Stipulation Pending</p> <p>RP # 6 National Register of Historic Places</p> <p>WO-ESA-7-Endangered Species Act</p> <p>WO-NHPA-National Historic Preservation Act</p>
<p><b>NM-201812-101      1280.000 Acres</b>  T.0210N, R.0050W, 23 PM, NM  Sec. 027 ALL;  028 ALL;</p>	<p>RP # 5 Designated Area of Critical Environmental Concern</p> <p>Paleontology Stipulation Pending</p> <p>RP # 6 National Register of Historic Places</p> <p>WO-ESA-7-Endangered Species Act</p> <p>WO-NHPA-National Historic Preservation Act</p> <p>NM-1-LN</p>
<p><b>NM-201812-102      1160.000 Acres</b>  T.0210N, R.0050W, 23 PM, NM  Sec. 029 ALL;  032 W2,W2E2,SESE;</p>	<p>RP # 5 Designated Area of Critical Environmental Concern</p> <p>Paleontology Stipulation Pending</p> <p>RP# 6 National Register of Historic Places</p> <p>WO-ESA-7-Endangered Species Act</p> <p>WO-NHPA-National Historic Preservation Act</p> <p>NM-1-LN</p>

<b>NM-201812-103      640.000 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 033   ALL;	RP # 5 Designated Area of Critical Environmental Concern  Paleontology Stipulation Pending  RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN
<b>NM-201812-104      640.000 Acres</b> T.0210N, R.0050W, 23 PM, NM Sec. 035   ALL;	RP # 5 Designated Area of Critical Environmental Concern  Paleontology Stipulation Pending  RP # 6 National Register of Historic Places  WO-ESA-7-Endangered Species Act  WO-NHPA-National Historic Preservation Act  NM-1-LN

502

### 503      **3.0 AFFECTED ENVIRONMENT**

504

505      This section describes the environment that would be affected by implementation of the  
506      alternatives described in Section 2. Aspects of the affected environment described in this section  
507      focus on relevant major resources and issues. Certain critical environmental components require  
508      analysis under BLM policy. Only those aspects of the affected environment that are potentially  
509      impacted are described in detail.

510      The proposed lease parcels are located in Sandoval County, New Mexico. This environmental  
511      assessment (EA) tiers to and incorporates by reference the information and analysis contained in  
512      the Rio Puerco Resource Management Plan, November 1986 (maintained and reprinted, 1992)  
513      (6) and the Albuquerque District Oil and Gas Plan Amendment, December 1991 (7).

514      This EA incorporates an analysis of the contributions of the proposed action to GHG emissions  
515      and a general discussion of potential impacts to climate. Air Resources.

516

### 3.1 Air Resources

Air quality, and climate change are the components of air resources, which include applications, activities, and management of the air resource. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision making process. Much of the information referenced in this section is incorporated from the Air Resources Technical Report for BLM Oil and Gas Development in New Mexico, Kansas, Oklahoma, and Texas (herein referred to as AR Technical Report, USDI BLM 2017). This document summarizes the technical information related to air resources and climate change associated with oil and gas development and the methodology and assumptions used for analysis.

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including six nationally regulated ambient air pollutants, known as criteria pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> & PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>) and lead (Pb). EPA has established National Ambient Air Quality Standards (NAAQS) for these criteria air pollutants. The NAAQS are protective of human health and the environment. These and New Mexico standards of concentration for each pollutant are included in Table 3.1. With the elimination of lead from gasoline and regulation of industrial sources, levels of lead in the atmosphere decreased 94% nationwide between 1980 and 1999. Lead concentrations decreased 60% nationally between 2000 and 2013. The major sources of lead pollution are lead smelters and leaded aviation gasoline. According to the 2014 National Emissions Inventory, aircraft account for 77% of the lead emissions in New Mexico. While still regulated as a criteria pollutant, lead will not be considered further in this discussion due to these significant reductions.

**Table 3.1. National Ambient Air Quality Standards (U.S. Environmental Protection Agency, 2016)**

Pollutant	Primary Standards Level	Primary Standards Averaging Time	Secondary Standards Level	Averaging Time	New Mexico AAQS*
Carbon Monoxide	9 ppm (10 mg/m³)	8-hour <sup>(1)</sup>	None	None	8.7ppm
	35 ppm (40 mg/m³)	1-hour <sup>(1)</sup>			13.1 ppm
Lead	0.15 µg/m³	Rolling 3-Month Average	Same as Primary		None
Nitrogen Dioxide	53 ppb	Annual (Arithmetic Average)	Same as Primary		50ppb

	100 ppb	1-hour <sup>(2)</sup>	None	100ppb (24-hour)
Particulate Matter (PM <sub>10</sub> )	150 µg/m <sup>3</sup>	24-hour <sup>(3)</sup>	Same as Primary	**TSP 150 µg/m <sup>3</sup> (24-hr)  **TSP 110 µg/m <sup>3</sup> (7-day)
Particulate Matter (PM <sub>2.5</sub> )	12.0 µg/m <sup>3</sup>	Annual <sup>(4)</sup> (Arithmetic Average)	15.0 ug/m <sup>3</sup> (Annual) <sup>(4)</sup> (Arithmetic Average)	**TSP 90 µg/m <sup>3</sup> (30-day)
	35 µg/m <sup>3</sup>	24-hour <sup>(5)</sup>	Same as Primary	**TSP 60 µg/m <sup>3</sup> (annual geometric mean)
Ozone	0.070 ppm	8-hour <sup>(6)</sup>	Same as Primary	None
Sulfur Dioxide	75 ppb	1-hour <sup>(7)</sup>	0.5 ppm <sup>(1)</sup> (3-hour)	0.02 ppm (annual) 0.10 ppm (24-hour)

\* 20.2.3 NMAC: \*\*Total Suspended Particulates

<sup>(1)</sup> Not to be exceeded more than once per year.

<sup>(2)</sup> To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).

<sup>(3)</sup> Not to be exceeded more than once per year on average over 3 years.

<sup>(4)</sup> To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 12.0 µg/m<sup>3</sup>.

<sup>(5)</sup> To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m<sup>3</sup> (effective December 17, 2006).

<sup>(6)</sup> To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.070 ppm.

<sup>(7)</sup> To attain this standard, the 3-year average of the 99<sup>th</sup> percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Hazardous air pollutants (HAPS) are pollutants suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. The EPA has identified 187 HAPS. The Clean Air Act requires control measures for hazardous air pollutants. These measures are sufficient for area sources of oil and gas and will be controlled through safety and regulatory measures.

The AR Technical Report details what climate is and its relationship with climate change as well as the Greenhouse Gas (GHG) effect and this information is tied to this EA. The most common GHGs related to oil and gas development are carbon dioxide, methane and nitrous oxide. Human activities emit billions of tons of carbon dioxide (CO<sub>2</sub>) every year. Carbon dioxide is primarily



emitted from fossil fuel combustion, but has a variety of other industrial sources. Methane (CH<sub>4</sub>) is emitted from oil and natural gas systems, landfills, mining, agricultural activities, and waste and other industrial processes. Nitrous oxide (N<sub>2</sub>O) is emitted from anthropogenic activities in the agricultural, energy-related, waste and industrial sectors. Air Quality

Regulation of air quality is either delegated to or “state implementation plan-approved” to all states. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. At the present time, the counties that lie within the jurisdictional boundaries of the Rio Puerco Field Office Lease Sale Parcels are classified as in attainment of all state and national ambient air quality standards as defined in the Clean Air Act of 1972, as amended (EPA, 2018a)

U.S. Environmental Protection Agency, EPA 2018a. Nonattainment Areas for Criteria Pollutants (Green Book). Assessed on September 4, 2018. Last updated August 31, 2018.

The nearest Class I area is Bandelier Wilderness Area, located approximately 65 kilometers southwest of the Planning Area. The area of the analysis is considered a Class II air quality area by the EPA. There are three classifications of areas that attain national ambient air quality standards, Class I, Class II and Class III. The AR Technical Report details the distinctions of Class I, II and III areas and this information is tiered to this EA for these purposes. The primary sources of air pollution in the proposed lease sale region are dust from blowing wind on disturbed or exposed soil, exhaust emissions from motorized equipment, oil and gas development, agriculture, and industrial sources.

### 3.1.1 Current Pollution Concentrations

“Design Concentrations” are the concentrations of air pollution at a specific monitoring site that can be compared to the NAAQS. Table 3.2 summarizes the design values representative of the lease sale sites. The nearest representative air quality monitors to the proposed lease sale sites are in Sandoval and San Juan County counties. The 2017 design concentrations of criteria pollutants are listed below. There is no monitoring for CO and lead in either counties, however due to the rural nature of the counties, it is likely that the concentrations of these pollutants are not elevated. A PM<sub>10</sub> monitor has been established in San Juan County however monitoring is not yet complete. The nearest active PM<sub>10</sub> and PM<sub>2.5</sub> monitors would be in Bernalillo County, however due to the urban nature of the area, these values are not considered representative to the lease sale sites and not used. PM<sub>10</sub> and PM<sub>2.5</sub> values are considered to be in attainment for the lease sale sites.

**Table 3.2 2017 Design Concentrations of Criteria Pollutants in San Juan County (EPA, 2018b)**

Pollutant	2017 Design Concentration	Averaging Time	NAAQS	NMAAQS
O <sub>3</sub> (Sandoval County)	0.065 ppm	8-hour	0.070 ppm <sup>1</sup>	
O <sub>3</sub> (San Juan County)	0.068 ppm	8-hour	0.070 ppm <sup>1</sup>	
NO <sub>2</sub> (San Juan County)	10 ppb	Annual	53 ppb	50 ppb
NO <sub>2</sub> (San Juan County)	35 ppb	1-hour	100 ppb <sup>2</sup>	
SO <sub>2</sub> (San Juan County)	2 ppb	1-hour	75 ppb <sup>4</sup>	
<sup>1</sup> Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years				
<sup>2</sup> 98th percentile, averaged over 3 years, represents 2015-2017 Design Value				
<sup>3</sup> Annual mean, averaged over 3 years				
<sup>4</sup> 99 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years				

Air quality in a given region can be measured by its Air Quality Index (AQI) value. In 2017 the Air Quality Index for Sandoval County was generally in the good to moderate (AQI<50, moderate 50-100), 99.7 percent of the time. Table 3.3 of the Appendix provides a description of the AQI indicators as well as a trend in Sandoval County for the last 10 years.

The air quality index (AQI) is reported according to a 500-point scale for each of the major criteria air pollutants, with the worst denominator determining the ranking. For example, if an area has a CO value of 132 on a given day and all other pollutants are below 50, the AQI for that day would be 132. The AQI scale breaks down into six categories: good (AQI<50), moderate (50-100), unhealthy for sensitive groups (100-150), unhealthy (>150), very unhealthy and hazardous. The AQI is a national index, the air quality rating and the associated level of health concern is the same everywhere in the country. The AQI is an important indicator for populations sensitive to air quality changes.

**Table 3.3 Number of Days classified as “unhealthy for sensitive groups” (AQI 101-150) (EPA, 2018c)**

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Days	0	0	0	0	0	0	0	0	0	1

USEPA. 2018c. Air Quality Index Basics. Accessed from <https://www.airnow.gov/index.cfm?action=aqibasics.aqi> Last updated July 31,2018.

### 3.1.2 Climate Change and GHGs

Information about (GHGs), their relationship to climate change and their effects on national and global climate is presented in the Air Resources Technical Report (U.S. Department of Interior Bureau of Land Management, 2017). Leasing the subject tracts under either action alternative would have no direct impacts to climate change as a result of GHG emissions. Any potential effects to climate change and GHG emissions from sale of a lease parcel would occur at such time that the lease was developed.

Climate change is a statistically-significant and long-term change in climate patterns. The terms climate change and “global warming” are often used interchangeably, although they are not the same thing. Climate change is any deviation from the average climate, whether warming or cooling, and can result from both natural and human (anthropogenic) sources. Natural contributors to climate change include fluctuations in solar radiation, volcanic eruptions, and plate tectonics. Global warming refers to the apparent warming of climate observed since the early-twentieth century and is primarily attributed to human activities such as fossil fuel combustion, industrial processes, and land use changes.

The natural greenhouse effect is critical to the discussion of climate change. The greenhouse effect refers to the process by which greenhouse gases (GHGs) in the atmosphere absorb heat energy radiated by earth’s surface. Water vapor is the most abundant GHG, followed by carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and several trace gases. These GHGs trap heat that would otherwise be radiated into space, causing earth’s atmosphere to warm and making temperatures suitable for life on earth. Without the natural greenhouse effect, the average surface temperature of the earth would be about zero degrees Fahrenheit. Water vapor is often excluded from the discussion of GHGs and climate change since its atmospheric concentration is largely dependent upon temperature rather than being emitted by specific sources.

The two primary GHGs associated with the oil and gas industry are carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>). Because methane has a global warming potential that is 21-28 times greater than the warming potential of CO<sub>2</sub>, the EPA uses measures of CO<sub>2</sub> equivalent (CO<sub>2</sub>e) which takes the difference in warming potential into account for reporting greenhouse gas emissions (U.S. Department of Interior Bureau of Land Management, 2017). Emissions will be expressed in metric tons of CO<sub>2</sub>e in this document. Nitrous oxide, a greenhouse gas normally considered, is not a significant contribution in field production activities and is therefore not included in estimating potential direct emissions.

### 3.2 Soil and Water Resources

Surface water occurrence on the parcels is in the form of ephemeral and intermittent streams, with some impoundments of varying sizes for livestock and wildlife watering and for erosion control. These streams flow for brief periods only in response to rainfall and snowmelt. Runoff and stream flow may result from summertime thunderstorms, melting snow in higher terrain, and

frontal system rainfall. Most annual maximum peak discharges and associated flooding concerns occur in the summer or early fall from summertime thunderstorms. Surface water drains from the proposed parcels is to both the Rio Grande and upper San Juan rivers, with the drainage area split approximately equally between each drainage.

The occurrence of ground water and its quality are complex and not completely defined within the area. The principal aquifers within the area are the Rio Colorado Plateau aquifers (Robson and Banta 1995). Depth to ground water is variable. Depth to water from drillers' records as reported by the New Mexico Office of the State Engineer (NMOSE) ranges from 160 feet to 769 feet below ground surface in the lease sale area.

Of the 40,800 acres proposed for leasing, there are 845 acres (2% of the lease acreage) of Federal Emergency Management Agency (FEMA) 100-year floodplain designation.

Of the 40,800 acres proposed for leasing, the majority of the acreage (37,895 acres or 95%) is relatively level to gently sloping, and occurs on mesas, plateaus, fan remnants and valley sides, and upland swales and valleys. Typical soils range from shallow to very deep, with the majority of the soils being deep and well drained. Only 1,568 acres (4% of the lease area) occur on slopes within the 15-30% steepness range, and only 494 acres (1% of the lease area) occur on slopes of greater than 30% steepness.

### 3.2.1 Water Usage

The analysis of the water usage for the Rio Puerco Lease Sale Environmental Assessment is based on the New Mexico Office of the State Engineer (NMOSE), New Mexico Water Use by Categories Technical Report 54 (Longworth, Valdez, Magnuson, & Richard, 2013). This report (*the Report*) is prepared every five years by the NMOSE and represents the most comprehensive, current, and useful water use data available for New Mexico. This analysis tabulates water usage for the New Mexico counties of McKinley, Rio Arriba, San Juan, and Sandoval, by category, and then more closely examines the category of Mining (MI). This section concludes with a projection of water usage for the number of wells (NOWs) predicted for the proposed and preferred actions in the lease sale environmental assessment.

Table 3.4 lists the total water withdrawals in the nine water use categories contained in *the Report* for the Albuquerque District, that is, the counties of Sandoval, Cibola, Bernalillo, Valencia, Torrance, Catron, Socorro, and McKinley; and figure 1 shows a pie chart for the total water withdrawals. Table 3.5 lists the water withdrawals for the Mining category and figure 2 shows a pie chart for this data.

The Mining category includes the following self-supplied enterprises that extract minerals occurring naturally in the earth's crust: Solids, such as potash, coal, and smelting ores; Liquids,

such as crude petroleum; Gases, such as natural gas. The breakdown of the major industries in the Mining category are: Metals; Oil and Gas; Potash; Aggregate; Industrial; Coal; and Geothermal. Note that the unit for water volume used in this analysis is acre-feet (AF).

**Table 3.4 Usage for the counties within Albuquerque District Office for the Water Year, 2010**

<u>Water Usage</u>	<u>Sandoval County</u>			<u>Cibola County</u>			<u>Bernalillo County</u>		
<u>Category</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>
Commercial	17	2848	2865	0	45	45	0	9032	9032
Domestic	0	2743	2743	0	1063	1063	0	2996	2996
Industrial	0	3066	3066	0	2749	2749	0	1072	1072
Irrigated Agriculture	48322	624	48946	1591	3855	5446	43309	2604	45913
Livestock	62	79	141	40	166	206	4	252	256
Mining	0	275	275	0	21	21	0	89	89
Power	0	0	0	0	0	0	0	466	466
Public Water Supply	219	15696	15915	0	2947	2947	45152	64991	110143
Reservoir Evaporation	5170	0	5170	1080	0	1080	0	0	0
County Totals	53790	25331	79121	2711	10846	13557	88465	81502	169967
<u>Valencia County</u>			<u>Torrance County</u>			<u>Catron County</u>			
<u>Category</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>
Commercial	0	221	221	0	276	276	0	235	235
Domestic	0	3686	3686	0	488	488	0	161	161
Industrial	0	331	331	0	1	1	0	0	0
Irrigated Agriculture	160215	11407	171622	0	59605	59605	21056	327	21383
Livestock	47	841	888	49	556	605	214	241	455
Mining	0	179	179	0	30	30	0	15	15
Power	0	6	6	0	0	0	0	0	0
Public Water Supply	0	6554	6554	0	1634	1634	46	160	206
Reservoir Evaporation	0	0	0	0	0	0	0	0	0
County Totals	160262	23225	183487	49	62590	62639	21316	1139	22455
<u>Socorro County</u>			<u>McKinley County</u>			<u>Albuquerque District Office Totals</u>			
<u>Category</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>	<u>WSW</u>	<u>WGW</u>	<u>TW</u>
Commercial	0	1348	1348	0	60	60	17	14065	14082
Domestic	0	356	356	0	3128	3128	0	14621	14621
Industrial	0	51	51	0	800	800	0	8070	8070
Irrigated Agriculture	110836	30385	141221	1095	0	1095	386424	108807	495231
Livestock	63	988	1051	99	400	499	578	3523	4101
Mining	0	23	23	0	2372	2372	0	3004	3004
Power	0	0	0	0	3415	3415	0	3887	3887
Public Water Supply	0	2294	2294	0	4123	4123	45417	98399	143816
Reservoir Evaporation	7570	0	7570	0	0	0	13820	0	13820
County Totals	118469	35445	153914	1194	14298	15492	446256	254376	700632

Note. WSW is withdrawal surface water, WGW is withdrawal ground water, TW is total withdrawals, and TW Total is the sum of TW for each county. The TW Total for the four counties is 700,632 AF, or 18% of the state total withdrawals for all water use in 2010.

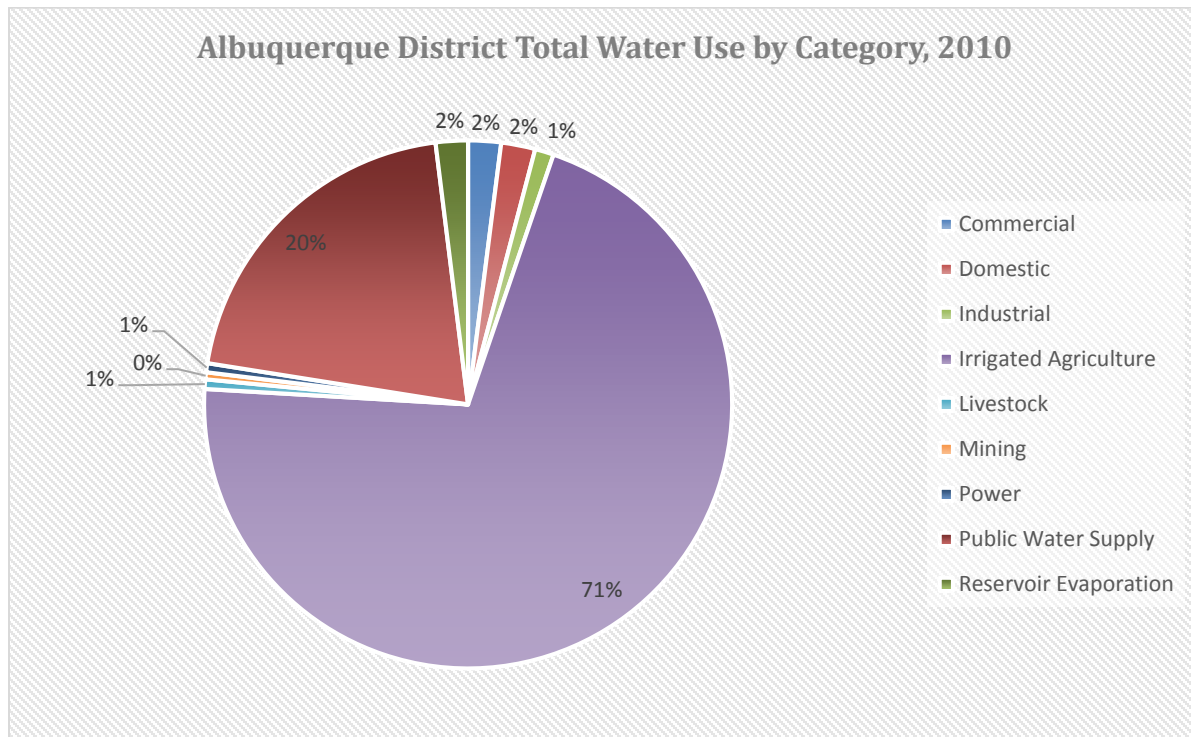
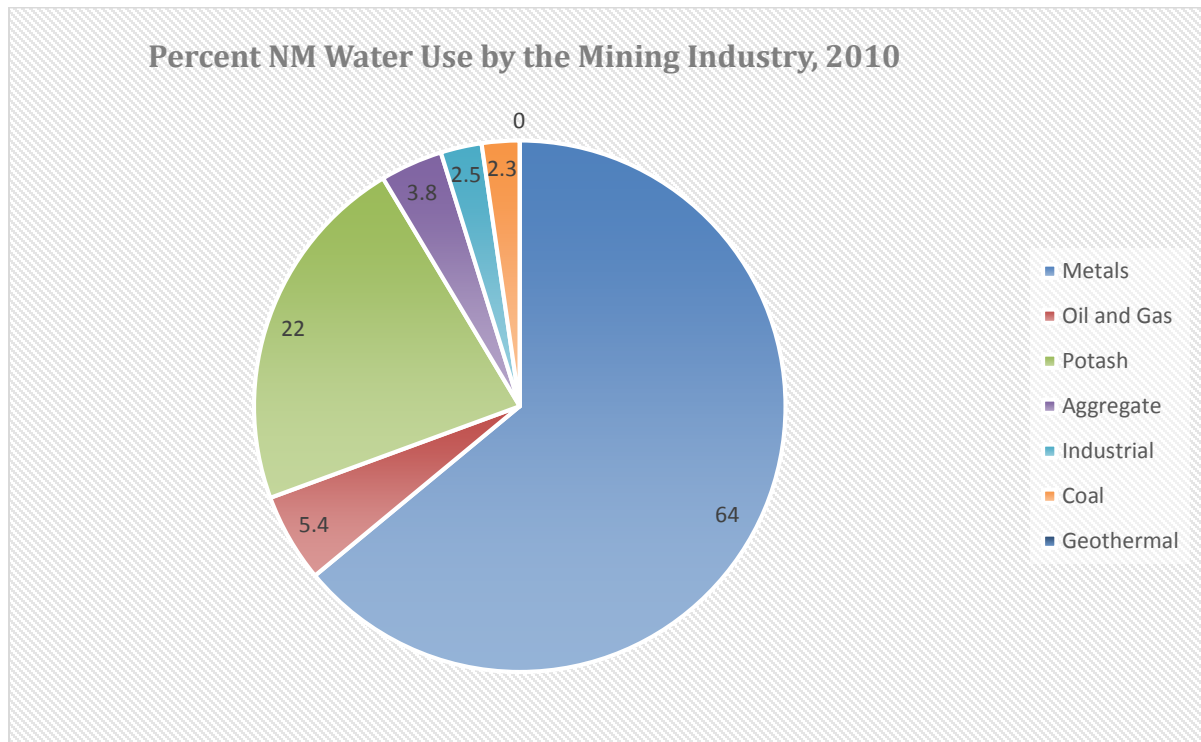


Figure 1. Total water withdrawal for the Albuquerque District Office. Categories are defined in the Report. Some 71% of the total water withdrawal is from Irrigated Agriculture, 20 % from the Public Water Supply, and less than 1% (0.43%) is from the Mining category.

Table 3.5 Percent Water Use by the Mining Category (MI), 2010

Percent Water Use by the Mining Category		
<u>Industry</u>	<u>% 2010 State</u>	<u>Calculated AF</u>
Metals	64	26598
Oil and Gas	5.4	2244
Potash	22	9143
Aggregate	3.8	1579
Industrial	2.5	1039
Coal	2.3	956
Geothermal	0	0
Total		41559



710  
711

712 *Figure 2. Oil and gas accounts for 5.4% of NM Water Use by the Mining category (2,244AF).*

713 Sandoval, Cibola, Bernalillo, Valencia, Torrance, Catron, Socorro, and McKinley counties water  
 714 usage accounts for about 18% (700,632 AF) of the total withdrawals for the state. Irrigated  
 715 Agriculture and Public Water Supply are the two largest categories, accounting for about 71%  
 716 (495,321 AF) and 20 % (143,816 AF), respectively, of the total water withdrawal for these  
 717 counties. Approximately 36% (254,376 AF) of the total water use for these counties is from  
 718 groundwater. Table 3.4 shows the percent groundwater use for each county in the Albuquerque  
 719 District. All of the parcels in this lease sale are from Sandoval County, and it has a percent  
 720 groundwater use of approximately 32% (25331 AF).

721 The data presented for the Mining Category (MI) in *the Report* are for the state as a whole.  
 722 Figure 2 shows the statewide water use of the MI category. The largest user was Metals at 64%  
 723 (26,598 AF). Oil and gas used 5.4% (2,244 AF) of the total as compared to Potash at 22%  
 724 (9,143 AF).

725

726           3.3 Vegetation

727   The parcels are in the Great Basin Foothill-Piedmont Grassland, Lowland/Swale Grassland, and  
728   Broadleaf Deciduous Desert vegetation communities, which are part of the Southern Desert  
729   Basin, Plains, and Mountain vegetation type.

730

731           3.4 Invasive, Non-Native Species

732   Populations of invasive and non-native species, primarily cheatgrass, Russian knapweed,  
733   tamarisk and Russian olive are scattered throughout the proposed lease sale area. For all actions  
734   on public lands that involve surface disturbance or rehabilitation, reasonable steps are required to  
735   prevent the introduction or spread of noxious weeds, including power washing or air blasting of  
736   construction equipment to remove soil and vegetative parts, requirements for using certified  
737   weed-free seed and weed-free hay, mulch and straw. In addition, any actions that result in the  
738   introduction or spread of invasive non-native or noxious weeds will be mitigated by standard  
739   weed management guidelines under the direction of BLM personnel.

740

741           3.5 Livestock Grazing

742   The land within the nominated parcels is within grazing allotments administered by the BLM.  
743   All the allotments have year round grazing permits. The allotments have retention dams, water  
744   troughs, and fences for management and distribution of livestock. Livestock grazing table can be  
745   found in appendix 7 table A7.1.

746

747           3.6 Wildlife

748   The proposed lease sale area provides habitat for a wide variety of wildlife species. Large  
749   ungulates in the area include mule deer and elk. Large predators include cougars and black bear.  
750   Smaller mammals include coyotes, bobcats, gray foxes, jackrabbits, cottontail rabbits, rock  
751   squirrels, woodrats, porcupines and a variety of bats and smaller rodent species. Reptiles include  
752   bullsnakes, rattlesnakes, whiptail lizards, and fence lizards. Bird species in the area include  
753   golden eagles, western bluebirds, great horned owls, piñon jays, mourning doves, Gambel's  
754   quail, scaled quail, Mearns' quail, red-tailed hawks, ferruginous hawks, kestrels, and a variety of  
755   migratory birds. Prairie dog habitat is also present in the general vicinity and likely supports a  
756   variety of wildlife as a keystone species including raptors and other species known to be  
757   associated. Habitat quality is fair to good for wildlife.

758   Eagle Mesa and Fork Rock Mesa are within approximately two miles of the project area. These  
759   areas are likely to house raptors and other migratory birds. Although the action of the lease sale  
760   will not directly affect these faunal species, the action of drilling has the potential to. If drilling



occurs, timing stipulations may be applied to avoid drilling during important nesting and migratory periods.

### 3.7 Special Status Species

An official species list was requested from the U.S. Fish and Wildlife Service New Mexico Ecological Services Field Office using the Information for Planning and Consultation (IPaC) website online (Consultation Code: 02ENNM00-2018-SLI-1199; Event Code: 02ENNM00-2018-E-02535; Project Name: BLM RPFO December 2018 Oil & Gas Lease Sale) on August 14, 2018.

Table 3.6 below contains the official list of endangered, threatened, and proposed species as well as BLM sensitive species that may occur in the project area or may be affected by the proposed action. The project area may not necessarily include all or any of these species. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Site-specific surveys for these species may be required, and mitigation measures may be included as conditions of approval.

Large projects may have effects outside the immediate area to species not listed here that should be addressed. If the action area has suitable habitat for any of the listed species, species-specific surveys may be required during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts.

Table 3.6 Rio Puerco Field Office special status species occurrence and impacts review in the project area. Designations are as follows: E = Endangered (Federal), T = Threatened (Federal), P = Proposed (Federal), C = Candidate (Federal), SOC = Species of Concern (Federal), BS = BLM Sensitive.

**Table 3.6 Official List of Endangered, Threatened, and Proposed Species as well as BLM Sensitive Status Species**

Species	Habitat/Range	Potential to occur in project area
<b>Yellow-billed Cuckoo (T)</b> <i>Coccyzus americanus</i>	In the West, this species is rare and restricted to the cottonwood-dominated forests that line larger rivers running through arid country. In the Southwest, Yellow-Billed Cuckoos are rare breeders in riparian woodlands of willows, cottonwoods and dense stands of mesquite to breed. Cibola, Sandoval, Bernalillo, Valencia Counties.	No
<b>Southwestern Willow Flycatcher (E)</b> <i>Empidonax traillii extimus</i>	The breeding site must have a water table high enough to support riparian vegetation, and are usually within close proximity (less than 20 yards or 18 meters) of water or very saturated soil in the form of large rivers, smaller streams, springs, or marshes. An important characteristic of the habitat appears to be the presence of dense vegetation, usually throughout all vegetation layers present, e.g. dense growths of willows, seepwillow, or other shrubs and medium-sized trees. There may be an overstory of cottonwood, tamarisk, or other large trees, but this is not always the case.	No
<b>Rio Grande silvery minnow (E)</b> <i>Hybognathus amarus</i>	Currently, the species is known to occur only in one reach of the Rio Grande in New Mexico, a 280-km stretch of river that runs from Cochiti Dam to the headwaters of Elephant Butte Reservoir; this includes a small portion of the lower Jemez River, a tributary to the Rio Grande north of Albuquerque. Habitat includes pools and backwaters of low-gradient creeks	No

Species	Habitat/Range	Potential to occur in project area
	and small to large rivers. This riverine minnow occurs in waters with slow to moderate flow in perennial sections of the Rio Grande and associated irrigation canals.	
<b>Zuni bluehead sucker (E)</b> <i>Catostomus discobolus yarrowi</i>	This sucker is native to headwater streams of the Little Colorado River in east-central Arizona and west-central New Mexico, at elevations of 2,000-6,760 feet. Habitat is generally low-velocity pools and pool-runs with seasonally dense periphytic and periphytic algae, particularly shady, cobble/boulder/bedrock substrates in streams with frequent runs and pools.	No
<b>Gunnison's prairie dog (BS)</b> <i>Cynomys gunnisoni</i>	High mountain valleys and plateaus at elevations of 1,830-3,660 meters. Major mortality factors are disease, predation, and humans. Colonies suffer drastic population declines and are often extirpated during outbreaks of flea-borne sylvatic plague. All NM counties.	Yes
<b>Jemez Mountains salamander (E)</b> <i>Plethodon neomexicanus</i>	The range is restricted to the Jemez Mountains in Sandoval, Los Alamos, and Rio Arriba counties, New Mexico, at elevations of 7,185-11,256 feet. This species occurs in mixed conifer habitat with abundant rotted logs and surface rocks; vegetation is dominated by Douglas-fir, blue spruce, Engelmann spruce, ponderosa pine, and white fir, with occasional aspen, Rocky Mountain maple, New Mexico locust, oceanspray, and various shrubby oaks. Terrestrial breeder.	No
<b>New Mexico meadow jumping mouse (E)</b> <i>Zapus hudsonius luteus</i>	In New Mexico, this jumping mouse has been found in the San Juan Mountains, Sangre de Cristo Mountains, Jemez Mountains, Sacramento Mountains, Rio Grande Valley (Espanola to the Bosque del Apache NWR), and lower Rio Chama Valley. ent surveys throughout New Mexico determined that populations persist at 6 locations in the Jemez Mountains, 2 locations in the Sangre de Cristo Mountains, and 2 isolated locations in the Sacramento Mountains. Habitat includes sedge-forb-willow zones along permanent streams (Jemez and Sacramento mountains); large wet meadows within river floodplains (Rio Grande Valley); and narrow riparian zones along irrigation ditches (Bosque del Apache NWR). In many areas, moist riparian zones with tall, dense sedges provide suitable habitat; the presence of beavers is useful in maintaining habitat. Nests generally are in dry soils.	No
<b>Mexican Spotted Owl (T)</b> <i>Strix occidentalis lucida</i>	Prefers mature old growth forests, but will use other forest types and rocky canyons. Nests in mixed conifer forests with cool moist microclimate. Cibola, Sandoval, Valencia, Torrance, McKinley Counties.	No
<b>Zuni fleabane (T)</b> <i>Erigeron rhizomatus</i>	Nearly barren detrital clay hillsides with soils derived from shales of the Chinle or Baca formations (often seleniferous); most often on north or east-facing slopes in open piñon-juniper woodlands at 2,200-2,400 m (7,300-8,000 ft). This plant is know from 3 locations in the Zuni Mountains near Fort Wingate, 28 locations (probably more) in the Sawtooth and northwest Datil mountains, and at least 3 locations in the Chuska Mountains on the Navajo Nation. The distribution of <i>Erigeron rhizomatus</i> is associated with the distribution of uranium deposits in west-central New Mexico. Many of the sites for this plant occur at historical or current mining claims that are uneconomical at present uranium prices. This could change with a greater demand for uranium. McKinley County.	No
<b>Western Burrowing Owl (BS)</b> <i>Athene cunicularia hypugaea</i>	Lives in dry, open areas with no trees and short grass. Found on golf courses, cemeteries, airports, vacant lots, university campuses, pastures, and prairie dog towns. Nests in burrow, often dug by a mammal. Catches food with feet. Hunts by walking, hopping, or running along the ground, or by flying from perch. Collision with cars is a major source of mortality. Sandoval, Bernalillo, Cibola and McKinley Counties.	Yes
<b>Townsend's big-eared bat (BS)</b> <i>Corynorhinus townsendii</i>	Maternity and hibernation colonies typically are in caves and mine tunnels. These bats prefer relatively cold places for hibernation, often near entrances and in well-ventilated areas. Throughout much of the known range, these bats commonly occur in mesic habitats characterized by coniferous and deciduous forests, but they occupy a broad range of habitats. In New Mexico, most have been captured in evergreen forests during warm months, least commonly captured in xeric shrublands. Sandoval, Bernalillo and Cibola Counties.	Yes
<b>Gypsum townsendia (BS)</b> <i>Townsendia gypsophila</i>	Entirely endemic to the Todilto and Summerville gypsum strata in Ojito/White Mesa region. The entire world-wide range is less than 20 miles (ca 30 km) of discontinuous gypsum outcrops in Sandoval County	No
<b>Knight's milk-vetch (BS)</b> <i>Astragalus knightii</i>	Knight.s milkvetch occurs on open sandstone ledges and cliff terraces in pinyon-juniper woodlands and gram-gelleta grasslands at elevations of 5,750 to 6,000 feet. Populations are found escarpments along the middle Rio Puerco drainage in the vicinity of Mesa Prieta.	Yes
<b>Parish's alkali grass (BS)</b> <i>Puccinellia parishii</i>	Alkaline springs, seeps, and seasonally wet areas that occur at the heads of drainages or on gentle slopes at 800-2,200 m (2,600-7,200 ft) range-wide. The species requires continuously damp soils during its late winter to spring growing period. <i>Puccinellia parishii</i> requires wet alkaline soils; activities that divert or dry up springs or seeps will destroy its habitat..	Yes

Species	Habitat/Range	Potential to occur in project area
	Cibola, McKinley and Sandoval Counties.	
<b>Spotted bat (BS)</b> <i>Euderma maculatum</i>	Central New Mexico. Found in various habitats from desert to montane coniferous stands, including open ponderosa pine, pinyon-juniper woodland, canyon bottoms, open pasture, and hayfields. Winter range not known.	Yes
<b>Allen's lappet-browed bat (BS)</b> <i>Idionycteris phyllotis</i>	Habitat is primarily mountainous wooded areas (e.g., ponderosa pine, pinyon-juniper, Mexican woodland, oak brush) but also includes riparian (e.g., cottonwood) woodland; habitat ranges from Mohave desert scrub of low desert ranges to white fir forest (Hoffmeister 1986). Typically this bat is found near rocks: cliffs, boulders, lava flows, etc., and it is frequently netted along streams or over ponds. Maternity colonies of 30 to 150 individuals have been found in mine shafts, boulder piles, sandstone crevices, lava beds, and beneath the loose bark of large ponderosa pine snags.	Yes
<b>Black-tailed prairie dog (BS)</b> <i>Cynomys ludovicianus</i>	Habitat consists of dry, flat or gently sloping, open grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle. The species occurs in open vacant lots at town edges in some areas. Young are born in underground burrows. Habitat includes all major grassland types--short, mixed, and tall.	No
<b>Cebolleta pocket gopher (BS)</b> <i>Thomomys bottae (umbrinus) paguatae</i>	**Nothing on nature serve.	
<b>Southwestern toad (BS)</b> <i>Anaxyrus (Bufo) microscaphus</i>	Range encompasses scattered locations in southwestern Utah, southern Nevada, Arizona, and western New Mexico. Habitat includes rocky stream courses in the pine-oak zone (e.g., Arizona, New Mexico), stream courses bordered by willows and cottonwoods, irrigation ditches, flooded/irrigated fields, and reservoirs.	No
<b>Bald Eagle (BS)</b> <i>Haliaeetus leucocephalus</i>	Bald Eagles typically nest in forested areas adjacent to large bodies of water, staying away from heavily developed areas when possible. Bald Eagles are tolerant of human activity when feeding, and may congregate around fish processing plants, dumps, and below dams where fish concentrate. For perching, Bald Eagles prefer tall, mature coniferous or deciduous trees that afford a wide view of the surroundings. In winter, Bald Eagles can also be seen in dry, open uplands if there is access to open water for fishing. Bald Eagles nest in trees except in regions where only cliff faces or ground sites are available. They tend to use tall, sturdy conifers that protrude above the forest canopy, providing easy flight access and good visibility. All NM Counties.	No
<b>Piñon Jay (BS)</b> <i>Gymnorhinus cyanocephalus</i>	Found in open pinyon-juniper woodland, sagebrush, scrub oak, and chaparral communities, and sometimes in pine forests. Ground forager. Populations declining. Destruction of pinyon-juniper habitat to create grazing land for cattle resulted in loss of many jays. Changes in fire regimes has resulted in loss of many pinyon pines, threatening Pinyon Jay populations.	Yes
<b>Bendire's Thrasher (BS)</b> <i>Toxostoma bendirei</i>	Desert, especially areas of tall vegetation, cholla cactus, creosote bush and yucca, and in juniper woodland. Ground forager. Nests in shrubs.	Yes
<b>Acoma fleabane (BS)</b> <i>Erigeron acomanus</i>	Sandy slopes and benches beneath sandstone cliffs of the Entrada Sandstone Formation in piñon-juniper woodland; 2,100-2,170 m (6,900-7,100 ft). Narrow endemic. May be impacted by mining operations. McKinley and Cibola Counties.	No
<b>Grama grass cactus (BS)</b> <i>Sclerocactus papyracanthus</i>	It prefers elevations from 5,000 to 7,500 feet and fine, sandy clay loams and red sandy soils. The species grows in red sandy soils of open flats in desert grasslands, often among perennial bunchgrasses such as blue grama ( <i>Bouteloua gracilis</i> ), galleta ( <i>Hilaria jamesii</i> ; Heil <i>et al.</i> 1981), <i>Sporobolus airoides</i> , <i>Pleuraphis muticus</i> and juniper-pinyon woodlands. McKinley, Santa Fe, Sandoval Counties.	Yes
<b>Galisteo sand verbena (BS)</b> <i>Abronia bigelovii</i>	Hills and ridges of gypsum in the Todilto Formation, 1,750-2,250 m (5,700-7,400 ft). Populations usually small and restricted to gypsum or strongly gypseous soils derived from gypsum outcrops. Sandoval, Santa Fe and Rio Arriba Counties.	No
<b>Clover's cactus (BS)</b> <i>Sclerocactus cloverae</i>	Almost entirely endemic to New Mexico. Usually occurs on eroding sandy clay soils derived from shales and sandstones in badlands regions of the Nacimiento formation. The elevation range for this subspecies is 1,680 – 2,200 m (5,510 – 7,220 ft).	Yes

789

## 790 3.8 Special Status Plants

791 The area proposed for lease contains potential, suitable and/or occupied habitats for Special  
792 Status Plant Species; therefore, special status plant species clearance surveys may be required

prior to approving any surface disturbing activities within or adjacent to BLM Special Status Plant Species' potential, suitable, and or occupied habitats.

### Areas of Critical Environmental Concern (ACECs)

The Torreon Fossil Fauna ACEC (Parcels 100, 101, 102, 103, and 104) as designated in the 1986 RMP (as amended) and carried forward in the Rio Puerco Draft RMP along with the proposed Bad Lands Extensive Recreational Management Area (ERMA) fall within several of the nominated parcels. This area, located near the head of Torreon Wash, is a major collecting area for fossil mammals. Wood et al (1941) formally defined this area as the type locality for the Torreon Fauna. A type locality is an important paleontological feature in that it represents the place at which a fossil assemblage is typically displayed and from which it derives its name. Type specimens of the Torreon Fauna were originally recognized and described from this locale. Thus, the area represents a unique and irreplaceable resource. Because of these important paleontological resources, this area meets the relevance (R-1, R-3) and importance (I-1, I-2, I-3) criteria.

### 3.9 Recreation

The parcels are located in an area that experiences low impact dispersed use, primarily hunting and dispersed hiking. Parcels 100, 101, 102, 103 and 104 fall within the Torreon Fossil Fauna West ACEC in which members of the public utilize the area for dispersed hiking, hunting, and paleontological viewing. Within parcels 82, 84, 85, 87, 88, 92, 98, and 100 the Oh-My-God Course C is located and within Course B is located within parcels 72 and 73.

Three separate and unique loop trails were designed and implemented for the Oh-My-God competitive motorcycle race. Oh-My-God consists of three courses, race course A, B, and C, which are designed solely for event use once every three years. Racecourse A is twenty-two miles, B is twenty-eight miles, and C is thirty-six miles. All three courses are only two to three miles from each other and are located west of Cuba, New Mexico, and north of State Road 197.

### 3.10 Cultural Resources

Cultural resources within Sandoval County range from Paleoindian residential and special activity sites; through many kinds of Archaic residential and special activity sites; the full range of Ancestral Puebloan sites; colonial Spanish sites; Navajo, Apache and Ute sites; and Hispanic and Anglo sites, including homesteads. More complete information can be found in *A Class II Cultural Resources Inventory of the Southern Portion of the Chaco Planning Unit, McKinley and Sandoval Counties, New Mexico* by Alan R. Dulaney and Steven G. Dosh, published in 1981 by the Bureau of Land Management; *A Class I and Class II Survey of the Rio Puerco Grazing Area* by Cheryl L. Wase, prepared in 1982 and on file at the Rio Puerco Field Office; and *Prehistory of the Middle Rio Puerco Valley, Sandoval County, New Mexico* edited by Larry L. Baker and Stephen R. Durand, published in 2003 by the Archaeological Society of New Mexico.

The lease sale itself does not directly authorize surface disturbance; rather, the leaseholders are granted future right of development to the leased mineral estate. The lease sales and future development are both Federal undertakings requiring compliance with Section 106 of the National Historic Preservation Act (NHPA). The RPFO is complying with Section 106 pursuant to Appendix C of the December 17, 2014 State Protocol between the New Mexico Bureau of Land Management and the New Mexico State Preservation Officer Regarding the Manner in which BLM will Meet Its Responsibilities under the National Historic Preservation Act in New Mexico, a two party agreement between BLM and NM SHPO. Consultation under 36 CFR 800.2 (c )(2)(ii) with Indian tribes that attach religious and cultural significance to historic properties that may be affected by an undertaking was undertaken separately. The RPFO uses a staged approach for the identification and evaluation of cultural resources for oil and gas leasing and development. In general, identification of historic properties takes place later, at the Application for Permit to Drill (APD) stage of lease development. Class III cultural resource inventories (intensive inventories) will be undertaken and impacts to archeological sites will be assessed at the APD stage. However, prior to the lease sale, the RPFO conducts a review of existing records and information for each lease parcel to identify historic properties recorded or projected to fall within the area of potential effect of the lease sale. The cultural heritage staff uses the information from the records review to assess the likelihood that adverse effects to previously recorded properties and those likely to exist within each lease sale parcel can be avoided, minimized, or mitigated by standard archeological and historical recordation techniques. Based on the information gathered during the lease sale existing records review, the Field Office cultural heritage specialist makes a Determination of Effect for the undertaking of the lease sale.

Sites are relatively scarce within the area being analyzed. BLM conducted a review of records in the Rio Puerco Field Office, as well as records available in the database maintained by the Archaeological Resource Management Section of the New Mexico Historic Preservation Division. The existing records indicate that of the approximately 41,000 acres, approximately 20 percent of the surface overlaying the proposed lease parcels has been inventoried for cultural resources. Ninety-seven sites with 107 components have been recorded within the proposed lease parcels. The existing records review is on file at the RPFO as NM-110-2018(IV)A.

The previously recorded sites in the proposed lease sale parcels identified by the existing records review are undated and Archaic lithic scatters, Navajo sites, and historic homesteads and ranching sites. No Ancestral Puebloan sites have been documented among the 97 previously recorded sites with 107 components identified by the records review. In addition to the inventory surveys reported in the records review, RPFO archaeologists and volunteers have intensively scouted the area of the proposed lease sale for over 20 years without identifying Ancestral Puebloan remains.

The closest Chacoan outlier to the proposed lease sale parcels is Raton Well, just under 10 miles from the southwest corner of the closest proposed lease parcel. The halo of the Raton Well Chacoan outlier community sites extends only 4 miles to the northeast towards the closest proposed lease sale parcel. Other than the sites in the Raton Well community halo, there are no other Chaco-era sites between the proposed lease parcels and Raton Well.

As noted above, the cultural heritage staff uses the information from the records review to assess the likelihood that adverse effects to previously recorded properties and those likely to exist within each lease sale parcel can be avoided, minimized, or mitigated by standard archeological and historical recordation techniques. While effects resulting from lease development to most of the previously recorded sites identified by the records review can be avoided, minimized, or mitigated by standard archeological and historical recordation techniques, historic properties were identified in three of the proposed lease parcels that effects cannot be avoided, minimized, or mitigated by such techniques. These include a small historic cemetery, and several Navajo traditional cultural properties, sacred sites, and/or traditional use areas.

### 3.11 Native American Religious Concerns

The assessment area lies within the traditional use areas of several Native American tribes, including the Navajo Nation (Counselor, Ojo Encino, and Torreon chapters), the Jicarilla Apache Nation, the Southern Ute Tribe, and the Ute Mountain Ute Tribe. Other tribes may have ancestral roots within or near the proposed lease parcels, including Acoma, Cochiti, Isleta, Jemez, Kewa, Laguna, Ohkay Owingeh, San Felipe, San Ildefonso, Sandia, Santa Clara, Taos, Tesuque, Zia and Zuni pueblos, the Comanche Tribe of Oklahoma, and the Hopi Tribe.

The RPFO cultural heritage staff has compiled a geographic information system (GIS) database of known traditional cultural properties, sacred sites, and traditional use areas within the field office. This database is based on Van Valkenburgh (1974), Martin (n. d.), York and Winter (1988), cultural resource Section 106 compliance reports and site forms, as well as responses received as a result of tribal consultation. There are known sensitive sites within two of the proposed lease sale parcels. No other specific traditional cultural concerns within the parcels were raised in the initial round of meetings with the chapter presidents and pueblo governors. The initial letters received by BLM from the tribes likewise raised no specific cultural concerns within the proposed lease sale parcels.

The NEPA process does not require a separate analysis of impacts to religion, spirituality, or sacredness. References to such beliefs or practices convey only the terminology used by participants involved in current and historic ethnographic studies and tribal consultation and coordination, and does not reflect any BLM evaluation, conclusion, or determination that something is or is not religious, sacred, or spiritual.

### 3.12 Dark Night Sky

The Navajo Chapters adjacent to the proposed lease parcels (Ojo Encino, Torreon, and Counselor) consider Night Skies to hold important cultural values. The night skies within the leasing area remain relatively unaffected by light pollution or “artificial sky glow.” Sky glow is the result of scattered artificial light in the atmosphere; it raises night sky luminance and creates the most visible negative effect of light pollution (Falchi et al. 2016).

*\*The New World Atlas of Artificial Night Sky Brightness. (Fabio Falchi, June 10, 2016)*

Electric lighting also increases night sky brightness and is the human-made source of sky glow. Light that is either emitted directly upward by luminaires or reflected from the ground is scattered by dust and gas molecules in the atmosphere, producing a luminous background. It has the effect of reducing one's ability to view the stars. Sky glow is highly variable depending on immediate weather conditions, quantity of dust and gas in the atmosphere, amount of light directed skyward, and the direction from which it is viewed. In poor weather conditions, more particles are present in the atmosphere to scatter the upward-bound light, so sky glow becomes a very visible effect of wasted light and wasted energy.

Sky glow is of most concern to the Navajo population because it reduces their ability to view celestial objects. Sky glow increases the brightness of the dark areas of the sky, which reduces the contrast of stars or other celestial objects against the dark sky background.

### 3.13 Tribal Consultation and Information Sharing

In general, consultation with Native American tribes to identify traditional cultural properties, sacred sites, and traditional use areas takes place when the resource management plan (RMP) is formulated or updated. If the RMP has not been updated, the Field Office determines whether Native American consultation has been sufficient. The Rio Puerco Field Office has determined that previous Native American consultation for these parcels was not sufficient. Consultation with the appropriate tribes (Acoma, Cochiti, Isleta, Jemez, Kewa, Laguna, Ohkay Owingeh, San Felipe, San Ildefonso, Sandia, Santa Clara, Tesuque, Zia and Zuni pueblos, the Comanche Tribe of Oklahoma, the Hopi Tribe, the Jicarilla Apache Nation, the Southern Ute Tribe, the Ute Mountain Ute Tribe, the Navajo Nation, and the Counselor, Ojo Encino and Torreon/Star Lake Navajo chapters) was initiated on June 27, 2018. At the request of the Southern Ute Tribe, an invitation to consult was sent to Taos Pueblo on August 13, 2018.

The Rio Puerco Field Office Manager and staff met in person with the chapter presidents and staffs of the Ojo Encino and Torreon chapters and staff from the Counselor Chapter, staff from the Jicarilla Nation, and the governors of Acoma Pueblo, Isleta Pueblo, Laguna Pueblo, Sandia Pueblo, San Felipe Pueblo, Santa Ana Pueblo, Santa Clara, and Zia Pueblo.

Written comments opposing the lease sale because of cultural concerns about the "Greater Chaco Region" were received from Acoma Pueblo, Isleta Pueblo, Laguna Pueblo, Sandia Pueblo, and San Felipe Pueblo, as well as the All Pueblo Council of Governors, and the Ojo Encino Navajo Chapter. Similar opposition was received from Santa Ana Pueblo, who oppose the lease sale based on "landscape and cultural setting of once occupied territory by Puebloan Ancestors." However, other than the general concern about the "Greater Chaco Region" or the "landscape and cultural setting of once occupied territory by Puebloan Ancestors," no specific traditional cultural concerns within the parcels were raised by the tribes consulted.

The review of existing records and many years of experience in the townships containing the proposed lease sale parcels has turned up no evidence that the proposed lease parcels lie within the Greater Chaco Region. The absence of archaeological evidence of use of the RPFO parcels

by Ancestral Puebloans, and the absence of Chaco-era sites within 6½ miles of the proposed lease parcels indicates that the RPFO parcels fall outside the Greater Chaco Region.

### 3.14 Socio-Economics/ Environmental Justice

The proposed parcels for the December 2018 lease sale are located in Sandoval County, New Mexico. Accordingly, the socioeconomic study area includes the nearest municipality within the assessment area (Cuba, New Mexico), the three adjacent Navajo Chapters and the State of New Of New Mexico.

The proposed lease parcels are located in northern Sandoval County adjacent to the Ojo Encino, Torreon and Counselor Navajo Chapters. Based on the most recent demographic and census data (Census, 2010) the estimated population for the Navajo Chapters within the assessment area is approximately 2,064 people combined while the nearest municipality (Cuba, NM) has approximately 731 people. The largest sector of the Navajo Chapters population are children 19 years of age and under (44%). (Ojo Encino, 2016), while the median age for the town of Cuba is 34.2 years as compared to the State of New Mexico, 37.7 years. The majority of the population in Cuba New Mexico is Hispanic and Native American approximately 69 % combined.

Executive Order 12898 required federal agencies to promote environmental justice by determining, and addressing as needed, whether the agency's programs, policies, and activities have a disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. When considered at a scale of county sub-regions surrounding the assessment area the population of minority race or ethnicity of 69% is similar as compared to the state of New Mexico overall, approximately 63%. (U.S. Census, 2010)

Leasing mineral rights for the development of federal minerals generates public revenue through the bonus bids paid at lease auctions and annual rents collected on leased parcels not held by production. Parcels approved for leasing are offered by the BLM at a minimum rate of \$2.00 per acre at the lease sale. These sales are competitive and parcels with high potential for oil and gas production often command bonus bids in excess of the minimum bid. In addition to bonus bids, lessees are required to pay rent annually until production begins on the leased parcel, or until the lease expires. These rent payments are equal to \$1.50 an acre for the first five years and \$2.00 an acre for the second five years of the lease. For 2016 overall revenue generate for the State of New Mexico through both Oil and Gas Leases/Rentals and production was:

**Table 3.7 Fiscal Year Renewables Table**

FY16 Renewable Revenue	Millions	FY 16 Non-Renewable	Millions
Oil and Gas Rental Bonus and Interest	\$42.7*	Oil and Gas Royalties	\$406.3*

\*New Mexico State Land Office 2016 Annual Report

### 3.15 Mineral Resources



It is the policy of the BLM to make mineral resources available for disposal and to encourage development of these resources to meet national, regional, and local needs, consistent with national objectives of an adequate supply of minerals at reasonable prices. At the same time, the BLM strives to assure that mineral development is carried out in a manner which minimizes environmental damage and provides for the reclamation of the lands affected.

Minerals are divided into three different class types; leasable, salable and locatable. Examples of leasable minerals are oil, gas coalbed methane and coal. Examples of salable minerals are sand, gravel, cinders and caliche. Examples of locatable minerals are gold, silver, copper and fluorspar.

The areas identified to be leased do not contain any development of leasable, salable or locatable minerals.

Currently there are 112 oil and gas leases covering approximately 107,763 acres in the Rio Puerco Field Office. These leases have a total of 170 producing, abandoned, and shut-in wells. Approximately 260 acres, or 0.24% of the leased area, are disturbed. If a parcel is leased and developed through drilling, a separate environmental document would be prepared. If full field development were to occur, additional NEPA analysis addressing cumulative impacts would be required.

### 3.16 Paleontology

BLM guidance (BLM Instruction Memorandum 2008-009) uses a Potential Fossil Yield Classification (PYFC) system for Paleontological Resources on Public Lands. The PYFC defines a classification system to provide a more uniform tool to assess the potential for Paleontological Resources occurrences and evaluate potential impacts. Five PFYC classes were developed, ranging from PFYC 1 to PFYC 5; Class 1 has very low potential for containing fossils while Class 5 has very high potential. The PFYC system is intended to be applied in a broad approach for planning efforts and as an intermediate step in evaluating specific projects.

Some of the parcels are located in a Class 3 Potential Fossil Yield Classification PFYC and some are located within a Class 5 PFYC.

Class 3—Moderate or Unknown. Fossiliferous or scientifically geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.

Class 5—Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

All proposed actions that are planned to occur through geologic units that are assigned a PFYC 5 require a pre-disturbance paleontological survey and monitoring during ground disturbing activities. A written report of the initial survey will include recommendations stating the findings

of the pre-disturbance survey. Once this report is reviewed and accepted by the Authorized Officer construction may be allowed to proceed. During any surface-disturbance actions in PFYC 5 areas, monitoring shall take place by a BLM- permitted paleontologist for any paleontological resources. Monitoring may also be required in PFYC 3 and other areas where surface fossils have been discovered or found in the same geologic unit directly adjacent to the project area.

Exposed geologic units assigned as PFYC 3 should be surveyed prior to any ground disturbance especially for area where the presence or absence of fossils is unknown. If no paleontological resources are identified during the initial survey monitoring of ground disturbance, further monitoring may not be required. This determination can be made by the Authorized Officer after review of the paleontological report developed by a permitted paleontologist. All paleontological surveys and monitoring are required to be conducted by a qualified, BLM permitted paleontologist.

Lease units 101 and 103 are contained entirely within the Torreon Fossil Faunal ACEC, with units 100, 102 and 104 encompassing only portions of the same ACEC. However, there are no stipulations specifically excluding Oil and Gas exploration within the ACEC plan.

## **4.0 Environmental Consequences and Proposed Mitigation Measures**

### **4.1 Assumptions for Analysis**

The act of leasing parcels would, by itself, have no impact on any resources in the Rio Puerco Field Office planning area. All impacts evaluated in this analysis would be linked to an undetermined level of lease development. Air Quality estimates are however based on the regulatory spacing of wells within a section to determine a maximum potential for air emissions. Furthermore, the terms of the lease, if sold, would require the drilling of at least one exploratory well on the parcel over the life of the lease. It is therefore reasonable to assume one exploratory well would be drilled to comply with the terms of the lease. In addition, if lease parcels were drilled, short-term impacts would be stabilized or mitigated within 5 years and long-term impacts are those that would substantially remain for more than 5 years.

### **4.2 Effects from the No Action Alternative and the Proposed Action**

Under the No Action Alternative and the Preferred Alternative the 30 proposed parcels would be deferred and not offered for sale in the December 2018 Competitive Oil and Gas Lease Sale. There would be no subsequent impacts from oil and/or gas construction, drilling, and production activities. The No Action Alternative as well as the Preferred Alternative would result in the continuation of the current land and resource uses in the proposed lease areas.

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#### 4.2.1 Mineral Resources

1057 There would be no new impacts from oil and gas production on the proposed parcel land. Oil and  
1058 gas development of federal, state, private, and Indian minerals would continue on the land  
1059 surrounding the proposed parcels. No additional natural gas or crude oil from the proposed  
1060 parcels would enter the public markets and no royalties would accrue to the federal or state  
1061 treasuries. An assumption is that the No Action Alternative (no lease option) and Proposed  
1062 Action would not affect current domestic production of oil and gas. However, this may result in  
1063 reduced Federal and State royalty income, and the potential for Federal land to be drained by  
1064 wells on adjacent private or state land. Oil and gas consumption is driven by a variety of  
1065 complex interacting factors including energy costs, energy efficiency, availability of other  
1066 energy sources, economics, demography, and weather or climate. If the BLM were to forego  
1067 leasing and potential development of the proposed parcels, the assumption is that the public's  
1068 demand for the resource would not be expected to change. Instead, the mineral resource foregone  
1069 would be replaced in the short- and long-term by other sources that may include a combination  
1070 of imports, using alternative energy sources (e.g. wind, solar), and other domestic production.  
1071 This offset in supply would result in a no net gain for oil and gas domestic production.  
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#### 4.2.2 Socio Economics/ Environmental Justice

1074 The direct effect of leasing and development would be the payments received from leasing all or  
1075 a subset of the acres of federal mineral estate. Indirect effects that might result, should  
1076 exploration or development of the leases occur, could include increased employment  
1077 opportunities related to the oil and gas and service support industry in the region as well as the  
1078 economic contributions to federal, state, and county governments related to lease payments,  
1079 royalty payments, severance taxes, and property taxes. However, there was no evidence available  
1080 to indicate that the jobs generated would be offered to the local communities of Cuba and the  
1081 Tri-Navajo Chapters. Other effects could include the potential for an increase in transportation,  
1082 roads, and noise disturbance associated with development, and potential for change in property  
1083 values due to development. These effects would apply to all public land users in the study area,  
1084 and surface owners above and adjacent to the proposed lease parcels.

1085 The BLM recognizes that economic activity associated with tourism and recreation can be an  
1086 important contribution to local communities and their economies. For example, the town of Cuba  
1087 and the Ojo Encino Navajo Chapter are developing economic plans tied to the visitation of BLM  
1088 lands such as the San Juan Badlands and the Continental Divide Trail and adjacent open spaces.  
1089 Potential impacts resulting from oil and gas development can be concerns for communities that  
1090 promote recreation and tourism. Oil and gas exploration, drilling, or production, would  
1091 potentially inconvenience visitors through increased traffic and traffic delays, noise, and visual  
1092 impacts. The level of inconvenience would depend on the activity affected, traffic patterns within  
1093 the area, noise levels, the length of time and season in which these activities occurred, and other  
1094 factors. Increased truck traffic hauling heavy equipment, fracking fluids, and water as well as

1095 increased traffic associated with oil workers and increased populations could cause more traffic  
1096 congestion, increase commuting times, and affect public safety. Additionally, impacts to visitors  
1097 could include reduction of current view sheds, dark night skies, and soundscapes.

1098 However, it is not yet known when, where, how, or if future surface disturbing activities  
1099 associated with oil and gas exploration and development such as well sites, roads, facilities, and  
1100 associated infrastructure would be proposed. It is also not known how many wells, if any, would  
1101 be drilled and/or completed, the types of technologies and equipment that would be used and the  
1102 types of infrastructure that would be needed for production of oil and gas. Based on the RFD  
1103 analyses the potential number of wells per parcel remains relative low (<1 to 5 wells) for the  
1104 nominated parcels, there is the potential for some possible impacts to tourism in local  
1105 communities from future oil and gas development when it may occur in these 30 parcels.

1106 No surface-disturbing activities are associated with a lease sale and; therefore, impacts from the  
1107 lease sale would not disproportionately adversely affect environmental justice populations. As  
1108 previously noted, any parcel where future drilling activity would take place would first require  
1109 additional NEPA analysis in which site specific impacts including environmental justice issues  
1110 will be examined. The BLM has considered all input from persons or groups regardless of age,  
1111 income status, race, or other social or economic characteristics. The outreach and public  
1112 involvement activities taken by the RPFO for this effort, including the consultation of tribes and  
1113 speaking with interested parties was extensive and is reflected on the issues analyzed within this  
1114 assessment.

#### 1115 4.3 Analysis of the Action Alternatives

##### 1116 4.3.1 Air Quality Impacts from All Action Alternatives

###### 1117 4.3.1.1 Direct & Indirect Effects

1118 Leasing the subject parcels would have no direct impacts on air quality. Any potential effects on  
1119 air quality from sale of lease parcels would occur at such time that the leases were developed.  
1120 Potential impacts of development would include increased air borne soil particles blown from  
1121 new well pads or roads, exhaust emissions from drilling equipment, compressor engines,  
1122 vehicles, flares, and dehydration and separation facilities, and volatile organic compounds during  
1123 drilling or production activities.

1124 In order to reasonably quantify emissions associated with well exploration and production  
1125 activities, certain types of information are needed. Such information includes a combination of  
1126 activity data such as the types of equipment needed if a well were to be completed successfully  
1127 (e.g. compressor, separator, dehydrator), the technologies which may be employed by a given  
1128 company for drilling any new wells, area of disturbance for each type of activity (e.g. roads,  
1129 pads, electric lines, compressor station), number of days to complete each kind of construction,  
1130 number of days for each phase of drilling process, type(s), size, number of heavy equipment used  
1131 for each type of construction (backhoe, dozer, etc.), number of wells of all types (shallow, deep,  
1132 exploratory, etc.), compression per well (sales, field booster), or average horsepower for each

type of compressor. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs. At this time, it is not feasible to directly quantify emissions from the proposed lease sale. What can be said is that exploration and production would contribute to incremental increases in overall air pollutant emissions associated with oil and gas exploration and production into the atmosphere.

The most significant criteria pollutants emitted by oil and gas development and production are VOCs, particulate matter and NO<sub>2</sub>. VOCs and NO<sub>2</sub> contribute to the formation of ozone, which is the pollutant of most concern in northwestern New Mexico. The additional NO<sub>2</sub> and VOCs emitted from any oil and gas development on these specific leases are likely too small in quantity to have a significant effect on the overall ozone levels of the area.

There are three phases in the development of a well that result in different levels of emissions. The first phase occurs during the first year of development and may include pad construction, drilling, completion, interim reclamation, and operation of the completed well. The first year results in the highest level of emissions due to the large engines required during the construction and drilling, and the potential release of natural gas to the atmosphere during completion.

The second phase of the well begins after the well is completed and is put on line for production. Emissions during the production phase may include vehicle traffic, engines to pump oil if necessary, compressor engines to move gas through a pipeline, venting from storage tanks, and storage tank heaters. A work-over of the well may occasionally be required, but the frequency of work-overs is not predictable. The final phase is to plug and abandon the well and rehab the pad.

The reasonable and foreseeable development scenario for the 1991 Albuquerque District RMP Oil and Gas Amendment (7) estimated 3 to 5 wells would be drilled annually for federal minerals. Current APD permitting trends within the field office confirm that the 1991 RMP assumptions are still accurate. However, it is unknown whether the petroleum resources specific to these leases in the Proposed Action are gas or oil or a combination thereof, as well as the actual potential for those resources. In addition, oil wells are on a tighter spacing than gas wells, therefore the specific number of wells that would be drilled as a result of issuing the leases is unknown.

In October 2012, USEPA promulgated air quality regulations for completion of hydraulically fractured gas wells (see Appendix 1). These rules require air pollution mitigation measures that reduce the emissions of volatile organic compounds during gas well completions.

#### 4.3.1.2 Potential Mitigation

The BLM encourages industry to incorporate and implement “Best Management Practices” (BMPs), which are designed to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Typical measures include: adhere to BLM’s Notice to Lessees’ (NTL) 4(a) concerning venting and flaring of gas on Federal leases for natural gas emissions that cannot be economically recovered, flare hydrocarbon gases at high

temperatures in order to reduce emissions of incomplete combustion; water dirt roads during periods of high use in order to reduce fugitive dust emissions; co-locate wells and production facilities to reduce new surface disturbance; implement directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and perform interim reclamation to re-vegetate areas of the pad not required for production facilities and to reduce the amount of dust from the pads. In addition, the BLM encourages industry to participate in the Gas STAR program that is administered by EPA. The Natural Gas STAR program is a flexible, voluntary partnership that encourages oil and natural gas companies to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce natural gas emissions.

An application for permit to drill (APD) is required for each proposed well to develop a lease. Onshore Oil and Gas Order No. 1 issued under 43 CFR 3160 authorizes BLM to attach Conditions of Approval (COA) to APDs during the permitting process. Additional analysis will be done at such time as an APD is requested and a determination will then be made on the need for mitigation based on the estimated level of emissions.

#### 4.3.2 Climate Change and GHGs

##### 4.3.2.1 Methods and Assumptions

There is uncertainty with estimating emissions during the production stage, however some level of estimating can be provided using a top-down approach with various assumptions. BLM has used a top-down approach to estimate greenhouse gas emissions. This approach provides a level of comparison for GHGs associated with oil and gas production managed by BLM to U.S. emissions from all oil and gas production and with total national emissions of all GHGs. To estimate the contribution of federal oil and gas leases to GHG emission in New Mexico, it is assumed the percentage of total U.S. production is comparable to the percentage of U.S. total emissions. Therefore, emissions are estimated based on total oil and gas production from the U.S. (EIA, 2018a and EIA 2018b) and total GHG emissions for the United States (EPA, 2018a), and applying production percentages to estimate emissions for the San Juan Basin.

To establish the exact number of wells in the Permian Basin is problematic due to the ongoing development of new wells, the abandonment of unproductive wells, land sales and exchanges, and incomplete or inaccurate databases. To determine the most transparent and publicly accessible method of estimating the number of active federal wells in the New Mexico portion of the San Juan Basin, BLM utilized the New Mexico Geographic Information System (GIS) and the New Mexico Conservation Division ONGARD Data Search (Petroleum Recovery Research Center 2015). Wells counts were pulled in 2015 and are assumed to represent an estimate of federal wells in 2015. ONGRAD was searched for all

active, new, and temporarily abandoned wells in NM. Table 4.1 shows oil and gas production throughout the New Mexico and the major federal mineral estates for oil and gas.

**Table 4.1 2016 Oil and Gas Production (EIA 2018a, EIA 2018b, ONRR 2018, EMNRD 2016)<sup>1</sup>**

Place	Oil Barrels (bbl)	% of US Total	Gas (MMcf)	% of US Total	Total O & G Production Emissions	% US Total O & G Production Emissions
United States	3,232,025,000	100	32,635,511	100	164,400,000	100
New Mexico	146,389,000	4.53	1,284,698	3.94	6,794,108	4.13
Federal Minerals in New Mexico	70,010,962	2.17	788,776	2.42	3,837,013	2.33
San Juan Basin <sup>3, 4</sup>	7,057,510	0.22	638,342	1.96	2,270,359	1.38
Permian Basin <sup>3</sup>	138,508,606	4.29	587,988	1.80	4,313,166	2.62

<sup>1</sup> Although Data Year 2017 was available, data Year 2016 is used to compare to the latest available US GHG Field Production values in the next table which uses 2016 data,

<sup>2</sup> Includes Onshore and Offshore Production values.

<sup>3</sup> San Juan Basin includes San Juan, Rio Arriba, Sandoval and McKinley counties. Permian Basin includes counties of Lea, Eddy, Chaves and Roosevelt.

<sup>4</sup> San Juan Basin gas production includes coalbed methane gas production.

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#### 1215 4.3.2.2 Direct & Indirect Effects

##### 1216 4.3.2.2.1 Direct

Assumptions based on the full lease development of the Proposed Alternative (30 wells) will be used in the analysis of oil and gas field production GHG impacts in this EA. In the event that all separate wells were completed on the proposed lease action, the maximum estimated potential direct emissions resulting from the proposed lease sale could be 3,827 metric tons of CO<sub>2</sub>e per year. This represents 0.0001 percent of total U.S. GHG Emissions and 0.06 percent of New Mexico Total U.S. O&G Field Production GHG emissions for the proposed and action. Table 4.2 provides data related to the production of the Proposed Action.

**1224 Table 4.2 Potential Direct Greenhouse Gas Emissions Resulting from Proposed Lease Sale**

GHG Emissions	Metric Tons (CO <sub>2</sub> e)	% US Emissions	% of NM O&G Emissions
Total U.S. GHG Emissions From Oil and Gas Field Production	164,400,000	2.52	NA
Total New Mexico Emissions From Oil and Gas Field Production	6,794,108	0.10	100
Total Emissions from Federal Production in New Mexico	3,837,013	0.06	56.48
Total Federal Mineral Estate San Juan Basin Emissions from Oil and Gas Field Production (16,289 wells)	2,270,359	0.03	33.42
Total Federal Mineral Estate Permian Basin Emissions from Oil and Gas Field Production (17,798 wells)	4,313,166	0.07	63.48

GHG Emissions	Metric Tons (CO <sub>2</sub> e)	% US Emissions	% of NM O&G Emissions
Total Potential GHG Emissions from Oil and Gas Field Production at Full Development (30 wells)	3,827	0.0001	0.06

#### 4.3.2.2.2 Indirect

##### 4.3.2.2.2.1 Methodology for Estimating Number of Oil and Gas Wells and Production Volumes

Estimates for the number of oil and gas wells and oil, gas, and water production volumes that could reasonably occur on these parcels were derived from the Reasonable Foreseeable Development Scenario (RFD) for Fluid Mineral Development in the Rio Puerco Field Office (NMSO, 2010) and the Farmington Mancos-Gallup RFD (Crocker and Glover, 2018).

These parcels occur in areas of low and moderate resource potential as determined by the 2010 NMSO RFD. Forecasted drilling rates delineated for each of these resource potential categories were used to calculate the projected number of wells that may be drilled on these parcels. For parcels where this method resulted in fractional values of less than one well per parcel (because of small parcel acreages and low anticipated drilling rates), the fractional values were adjusted to one well per parcel to provide meaningful inputs to the oil, gas, and water production projections.

While the 2010 NMSO RFD did not include oil, gas, or water production projections, the 2018 Farmington Mancos-Gallup RFD included estimated ultimate recoveries (EURs) of oil, gas, and water volumes per well for San Juan Basin horizontal and vertical wells that produce from the same geologic formations that underlie the Rio Puerco parcels. The oil, gas, and water production projections for these parcels were calculated by multiplying the appropriate oil, gas, and water EUR per well by the number of wells projected for these parcels (calculated using the method described above).

The plays and the calculated EURs per well are listed in Table. 4.3

**Table 4.3 Plays and the calculated EURs Calculated Per Well**

Hole Direction	Formation	OIL (bbls)	GAS (mcf)	WATER (bbls)
Vertical	Generalized San Juan Basin Typ. Well	19,115	3,234,964	140,382
Horizontal	Mancos	125,678	1,244,285	69,537



1252 The projected number of wells and associated oil, gas and water production for these parcels  
1253 are summarized in Table 4.4.

1254

1255 **Table 4.4 Well Counts and Production Volume Estimates**

<b>Parcel Number</b>	<b>Acres</b>	<b>Vertical Wells</b>	<b>Horizontal Wells</b>	<b>Total Wells on Parcel</b>	<b>Total OIL (bbls)</b>	<b>Total GAS (mcf)</b>	<b>Total WATER (bbls)</b>
100	2400	0	1	1	125,678	1,244,285	69,537
101	1280	0	1	1	125,678	1,244,285	69,537
102	1160	0	1	1	125,678	1,244,285	69,537
103	640	0	1	1	125,678	1,244,285	69,537
104	640	0	1	1	125,678	1,244,285	69,537
74	792.92	0	1	1	125,678	1,244,285	69,537
75	640	0	1	1	125,678	1,244,285	69,537
76	1424.62	0	1	1	125,678	1,244,285	69,537
88	961.88	0	1	1	125,678	1,244,285	69,537
95	958.2	0	1	1	125,678	1,244,285	69,537
96	800	0	1	1	125,678	1,244,285	69,537
98	1920	0	1	1	125,678	1,244,285	69,537
99	1440.4	0	1	1	125,678	1,244,285	69,537
72	2005.95	1	0	1	19,115	3,234,964	140,382
73	2080	1	0	1	19,115	3,234,964	140,382
77	2560	1	0	1	19,115	3,234,964	140,382
78	1280	1	0	1	19,115	3,234,964	140,382
79	800	1	0	1	19,115	3,234,964	140,382
80	2041.68	1	0	1	19,115	3,234,964	140,382
81	2459.04	1	0	1	19,115	3,234,964	140,382
82	2433.02	1	0	1	19,115	3,234,964	140,382
83	1680	1	0	1	19,115	3,234,964	140,382
84	1923.76	1	0	1	19,115	3,234,964	140,382
85	1280	1	0	1	19,115	3,234,964	140,382
86	480	1	0	1	19,115	3,234,964	140,382
87	1680	1	0	1	19,115	3,234,964	140,382
92	1279.84	1	0	1	19,115	3,234,964	140,382
93	320	1	0	1	19,115	3,234,964	140,382
94	161.06	1	0	1	19,115	3,234,964	140,382
97	1280	1	0	1	19,115	3,234,964	140,382

Parcel Number	Acres	Vertical Wells	Horizontal Wells	Total Wells on Parcel	Total OIL (bbls)	Total GAS (mcf)	Total WATER (bbls)
<b>TOTALS</b>	<b>40,802.37</b>	<b>17</b>	<b>13</b>	<b>30</b>	<b>1,958,769</b>	<b>71,170,093</b>	<b>3,290,475</b>

Potential indirect GHG emissions, downstream/end-use GHG emissions, are usually not calculated for a particular subset of the cumulative/ total oil and gas production (i.e., for a field office/planning area oil and gas Reasonable Foreseeable Development [RFD] scenario) but these downstream emissions are directly related to end-use energy consumption. The challenge for estimating these downstream emissions comes with understanding how the oil and gas will ultimately be distributed and used for energy. Because this information is not typically available during the planning stage, an alternate method of end-use emissions estimation based on production data was developed. Indirect GHG emissions are estimated based on speculative oil and gas production. Total gas production for the thirty (30) parcels during the life of the well is 71,170,080 mcf and total oil production is 1,958,769 bbl. These production values were used to obtain the potential indirect GHG emissions.

To estimate end-use GHG emissions, the oil and gas recovery volumes were applied to the Proposed (30 wells) production volumes for the life of the well. GHG end-use (combustion) emission factors and Global Warming Potentials (GWPs) were applied and converted to units of MT/mcf and Mt/bbl and finally MT of CO<sub>2</sub>e. GHG combustion emission factors and GWPs for natural gas and petroleum were obtained from 40 CFR Part 98, Subparts A and C. GHG end-use emissions from oil production is estimated to be higher than emissions from gas production due to the higher carbon dioxide emission factor for oil. Total estimated end-use GHG emission contributions of the proposed action if all wells were developed is 842,271 million metric tons of CO<sub>2</sub>e and 3,894,294 million metric tons of CO<sub>2</sub>e respectively from oil and gas recovery, see Table 4.5.

**Table 4.5 Estimated Indirect GHG emissions <sup>1</sup> based on the Estimated Ultimate Recovery estimates (Insert RFD Reference, EPA, 2016).**

Product Category	Estimated Product Quantity Proposed Action	Emission Factor	Estimated Emissions (MT CO <sub>2</sub> e of GHG) Proposed Action
Crude Oil (bbl)	1,958,769	0.43 MT CO <sub>2</sub> /bbl	842,270.67
Natural Gas (Mcf)	71,170,080	0.054717 MT CO <sub>2</sub> /Mcf	3,894,294.02
Total			4,736,564.69

(EPA 2016) Environmental Protection Agency Greenhouse Gas Equivalencies Calculator, May 2016

#### 4.3.2.2.2 Uncertainty

It is important to note that the BLM does not exercise control over the specific end use of the oil and gas produced from any individual federal lease. The BLM has no authority to direct or regulate the end use of the produced oil and/or gas. As a result, the BLM can only provide an estimate of potential GHG emissions using national approximations of where or how the end use may occur because coal, oil, condensate, and natural gas could be used for combustion of transportation fuels, fuel oils for heating and electricity generation, as well as production of asphalt and road oil, and the feedstocks used to make chemicals, plastics, and synthetic materials.

Uncertainties regarding the number of wells and other factors result in a moderate to high degree of uncertainty and speculation with regard to GHG estimates at the leasing stage. At the APD stage, more site-specific information on oil and gas activities resulting in GHG impacts would be described in detail. Also at the APD stage, the BLM would review and evaluate operations, require mitigation measures, and encourage operators to participate in the voluntary STAR program.

Further, the best results of impacts analysis to air quality as a result of lease development would be at the time of application for specific projects, the APD stage and further the leasing stage

#### 4.3.2.2.3 Mitigation Measures

The BLM requires industry to incorporate and implement BMPs, which are designed to reduce impacts to air quality, and subsequently GHGs, by reducing emissions from field production and operations. Typical measures include adherence to BLM's regulations concerning the venting and flaring of gas on Federal leases for natural gas emissions that cannot be economically recovered, flaring hydrocarbon gases at high temperatures to reduce emissions of incomplete combustion, implementing directional and horizontal drilling and completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores, and suggestions that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored.

In addition, the BLM encourages industry to participate in the Natural Gas STAR program that is administered by the USEPA. The Natural Gas STAR program is a flexible, voluntary partnership that encourages oil and natural gas companies to adopt proven, cost effective technologies and practices that improve operational efficiency and reduce natural gas emissions.

#### 4.3.2.3 Cumulative

Cumulative effects of greenhouse gas emission can be expected to occur. It is important to note that at the leasing stage, it is uncertain if and when APDs on leased parcels would be

received, nor is it known to what extent development would occur. The cumulative impacts of GHG emissions and their relationship to climate change are evaluated at the national and global levels in the Air Resources Technical Report (BLM 2017). Potential cumulative effects are likely to occur should an oil and gas field be developed and other infield wells are drilled within the leases or if these leases become part of a new unit.

The primary activities that contribute to levels of air pollutant and GHG emissions in southeastern New Mexico are electricity generation stations, fossil fuel industries and vehicle travel. The Air Resources Technical Report includes a description of the varied sources of national and regional emissions that are incorporated here to represent the past, present and reasonably foreseeable impacts to air resources. It includes a summary of emissions on the national and regional scale by industry source (BLM 2017).

The very small increase in GHG emissions that could result from approval of the action alternatives would not produce climate change impacts that differ from the No Action Alternative. This is because climate change is a global process that is impacted by the sum total of GHGs in the Earth's atmosphere. The incremental contribution to global GHGs from the proposed action cannot be translated into effects on climate change globally or in the area of this site-specific action. It is currently not feasible to predict with certainty the net impacts from the proposed action on global or regional climate.

#### 4.3.3 Soil and Water Resources

##### 4.3.3.1 Direct and Indirect Effects

If the proposed parcels are drilled, wells would most likely pass through usable groundwater. Potential impacts to groundwater resources could occur if proper cementing and casing programs are not followed. This could include loss of well integrity, surface spills, or loss of fluids in the drilling and completion process. Without proper casing and cementing of the well bore, it is possible for chemical additives used in drilling and completion activities to be introduced into usable water (TDS<10,000 ppm) zones. However, BLM Onshore Order #2 requires protection of usable groundwater through proper drilling, cementing and casing procedures. When an operator submits an APD, the operator must submit a site specific drilling plan. The BLM petroleum engineer reviews the drilling plan, and based on site specific geologic and hydrologic information, ensures that proper drilling, casing and cementing procedures are incorporated in the plan in order to protect usable groundwater. This isolates usable water zones from drilling, completion/fracturing fluids, and fluids from other mineral bearing zones, including hydrocarbon bearing zones. Conditions of approval are attached to the APD, if necessary, to ensure groundwater protection. At the end of the well's economic life, the operator must submit a plugging plan which undergoes review by the BLM petroleum engineer prior to well plugging, which ensures permanent isolation of usable groundwater from hydrocarbon bearing zones. BLM inspectors ensure planned procedures are properly followed in the field. The State of New

1357 Mexico also has regulations for drilling, casing and cementing, completion and plugging to  
1358 protect freshwater zones.

1359 If the parcels are developed, wells within the parcels may be completed using hydraulic  
1360 fracturing techniques. Hydraulic fracturing is intended to change the physical properties of  
1361 producing formations by increasing the flow of water, gas, and/or oil around the wellbore,  
1362 resulting from the introduction of water, proppant (sand) and chemical additives into the  
1363 producing formations. Types of chemical additives used in completion activities may include  
1364 acids, hydrocarbons, thickening agents, gelling agents, lubricants, and other additives that are  
1365 operator and location specific. The largest components in hydraulic fracturing fluid are water and  
1366 sand. If contamination of aquifers from any source occurs, changes in groundwater quality could  
1367 impact springs and water wells that are sourced from the affected aquifers. BLM Onshore Order  
1368 #2 requires that the proposed casing and cementing programs shall be conducted as approved in  
1369 the APD to protect and/or isolate all usable water zones from other geologic formations  
1370 (including the hydrocarbon producing zones), and any completion fluids introduced in the  
1371 wellbore.

1372 Requirements of Onshore Order #2 (along with adherence to state regulations) make  
1373 contamination of groundwater resources highly unlikely. Surface casing and cement would be  
1374 extended beyond usable water zones. Production casing will be extended and adequately  
1375 cemented within the surface casing to protect other mineral formations, in addition to usable  
1376 water bearing zones. These requirements ensure that drilling fluids, hydraulic fracturing fluids  
1377 and produced water and hydrocarbons remain within the well bore and do not enter groundwater  
1378 or any other formations.

#### 1379 4.3.3.1.1 Surface Water:

1380 Impacts to surface water resources would be associated with surface disturbance from the  
1381 construction of roads, pipelines, well pads, and power lines. Specific impacts could include  
1382 increased soil movement due to vegetation removal and soil compaction caused by construction  
1383 that would reduce soil infiltration rates, in turn increasing runoff during precipitation events.  
1384 Downstream effects of the increased runoff may include sedimentation and changes in  
1385 downstream channel morphology such as bed and bank erosion or accretion. Impacts would be  
1386 greatest shortly after the start of the activity and decrease over time. These impacts are expected  
1387 to be mitigated by the implementation of design features and conditions of approval (COA)  
1388 including stormwater control measures that would slow runoff and capture sediment, and require  
1389 proper revegetation at the interim and final reclamation phases. Construction and reclamation  
1390 activities would be in accordance with BLM Gold Book standards where applicable. These  
1391 measures would be applied at the APD stage to address site specific conditions based on  
1392 submitted surface use plans of operations as required by the BLM. In addition, the State of New  
1393 Mexico requires stormwater protection plans for disturbances greater than one acre.

#### 1395 4.3.3.2 Potential Mitigation

1396 The act of leasing the parcels for oil and gas development would have no direct impact on water  
1397 resources; however, activities at the exploration and development stage could have impacts to  
1398 water quality and quantity. The magnitude and location of direct and indirect effects cannot be  
1399 predicted with accuracy until the site-specific APD stage of development, at which time  
1400 groundwater resources will be analyzed. No lease stipulations for the proposed parcels  
1401 specifically address either surface or groundwater quality; however, there are regulations in place  
1402 that require protection of water quality. If these parcels are developed, operators would be  
1403 required to adhere to state and federal regulations, and implement proper site specific design  
1404 features. Therefore, development is not expected to result in waters not meeting quality  
1405 standards. Similar to water quality, water quantity impacts cannot be predicted with accuracy  
1406 until the site specific APD stage. Many factors, such as well type, depth, the formation being  
1407 drilled, and the use of recycled water, influence the amount and timing of water used to  
1408 construct, drill and complete a well.

1409 Site-specific mitigation measures and Best Management Practices (BMPs) would be attached as  
1410 Conditions of Approval (COAs) for each proposed exploration and development activity  
1411 authorized on a lease. Impacts to floodplains, streams, and ponds reservoirs would be reduced to  
1412 levels below significance by application of associated stipulations to all relevant parcels.

1413 The effectiveness of BMPs depends on proper design, implementation, monitoring, and  
1414 maintenance of the BMPs employed. COAs would address design features such as such as road  
1415 and pad location and design, temporary and permanent erosion and sediment control measures,  
1416 and stabilization measures that would promote permanent natural vegetative stabilization and  
1417 reclamation of disturbed areas. Road locations, construction, and maintenance requirements  
1418 would limit potential impacts to the soil and water resources from the development of access  
1419 roads.

1420 Generally, flood prone areas would be avoided when determining the placement of oil and gas  
1421 infrastructure. Any new access roads crossing floodplains would be designed to minimize  
1422 impact to natural floodplain functions.

1423 Effective interim and final reclamation of facilities is also a mitigation to potential negative  
1424 effect on the soil resource because establishing vegetation would render the sites less susceptible  
1425 to erosion. Upon abandonment of the wells and/or when access roads are no longer in service,  
1426 surface reclamation/restoration standards for the disturbed areas would be specified in the  
1427 Conditions of Approval.

1428 Existing State of New Mexico drilling regulations for oil and gas wells would require an  
1429 adequate casing program designed to protect ground water from contamination, and by  
1430 controlling surface pollution that could migrate to ground water. The use of lined reserve pits  
1431 would reduce or eliminate seepage of drilling fluid into the soil and prevent it from eventually  
1432 reaching groundwater. The casing and cementing requirements imposed on proposed wells  
1433 would reduce or eliminate the potential for groundwater contamination from drilling mud and

other surface sources. Reserve pits would be reclaimed and restored as described in the Conditions of Approval at the APD stage.

#### 4.3.3.2.1 Water Usage

It is possible to make a linear projection of water use for the lease sale scenario using data from *the Report* and adding the additional water use due to increased drilling, predicted in the lease sale, to the “Oil and Gas” Industry row in Table 4.6, while keeping the other rows constant. This method will be used in the “Methodology for Estimating Number of Oil and Gas Wells section”.

**Table 4.6 Percent Groundwater Use for each County in Albuquerque District**

Groundwater Use				
County	WSW	WGW	TW	%Groundwater Use
Sandoval	53790	25331	79121	32.02
Cibola	2711	10846	13557	80.00
Bernallilo	88465	81502	169967	47.95
Valencia	160262	23225	183487	12.66
Torrance	49	62590	62639	99.92
Catron	21316	1139	22455	5.07
Socorro	118469	35445	153914	23.03
McKinley	1194	14298	15492	92.29
Total	446256	254376	700632	NA

*Note:* The percent of groundwater use in Sandoval County is 32.

#### 4.3.3.2.1.1 Methodology for Estimating Number of Oil and Gas Wells section

Estimates for the number of oil and gas wells that could reasonably occur on these parcels were derived from the Reasonable Foreseeable Development Scenario (RFD) for Fluid Mineral Development in the Rio Puerco Field Office (NMSO, 2010) and the Farmington Mancos-Gallup RFD (Crocker and Glover, 2018).

These parcels occur in areas of low and moderate resource potential as determined by the 2010 NMSO RFD. Forecasted drilling rates delineated for each of these resource potential categories were used to calculate the projected number of wells that may be drilled on these parcels. For parcels where this method resulted in fractional values of less than one well per parcel (because of small parcel acreages and low anticipated drilling rates), the fractional values were adjusted to one well per parcel to provide meaningful inputs. .

The Reasonable Foreseeable Development (RFD) Scenario for Oil and Gas Activities, Mancos-Gallup RMPA Planning Area, Farmington Field Office, Northwestern New Mexico (Glover & Crocker, 2017) is a reasonable estimate of the development associated with hydrocarbon

production in the Mancos-Gallup RMPA for the next 20 years (2018-2037). The RFD is a comprehensive study of all existing plays and an analysis of recent activity, historical production, emerging plays for future potential, and completion trends. In addition, the RFD estimated the water use that will be required for hydraulic fracturing in the RFD scenario, “Within the RMPA Planning Area, we estimate that hydraulically fracturing the wells projected for the period 2018-2037 will require 2.5 billion gallons (7,683 acre-feet) of water over the 20-year period. These estimates do not account for re-use or recycling of hydraulic fracturing fluid. Fracturing fewer wells and/or re-using or recycling hydraulic fracturing fluid would reduce these volumes.”

The number of wells predicted for the Proposed Action in the lease sale is 30. Table 4.7 shows the vertical and horizontal number of wells, and water usage for the lease sale. The water usage column used a factor of 3.2 AF/horizontal well (Engler, 2015) and 0.537 (Glover & Crocker, 2017) AF/vertical well. The total water use for the Proposed Action is 50.7 AF, that is, approximately 0.7% of the RFD scenario.

**Table 4.7 Water Usage for the Lease Sale**

<u>Water Usage for the Lease Sale</u>			
Type	<u>NOW's</u> <u>Vertical</u>	<u>NOW's</u> <u>Horizontal</u>	<u>Water Usage</u>
Proposed	17	13	50.7
Preferred	NA	NA	NA

*Note.* “NOWs” is number of wells and, “Water Usage” used a factor of 3.2 AF/horizontal well and 0.537 AF/vertical well.

Table 4.8 is a projection of water use for the lease sale into the Mining Category, 2010. The total water use is 50.7 AF for the lease sale. The RFD is a 20-year scenario. For any given year, the water use would be the total water use divided by 20 years, giving a 2.54 AF increase over the 2244.19 AF in *the Report*, for a total of 2247.72 AF for the Oil and Gas Industry (also see Table 4.8). Table 4.8 shows that the water use for the Oil and Gas Industry would increase from 5.40% to 5.406% of the Mining category for the Proposed Action.

**Table 4.8 Projection of Water Use for the Lease Sale into the Mining Category, 2010**

<u>Industries</u>	<u>% Water</u> <u>Use</u>	<u>AF</u>	<u>Proposed</u> <u>Action</u>	<u>Increase Due to Proposed Action</u>
Metals	64	26597.76	26597.76	64.00
Oil and Gas	5.4	2244.19	2246.72	5.406
Potash	22	9142.98	9142.98	22.00
Aggregate	3.8	1579.24	1579.24	3.80
Industrial	2.5	1038.98	1038.98	2.50



Coal	2.3	955.86	955.86	2.30	1484
Geothermal	0	0	0	0.00	
Total	100	41559.00	41561.54	100.00	1485

Note. The percent increase, due to the proposed action, to the Mining Category for New Mexico, 2010 is from 5.4% to 5.406%.

#### 4.3.3.3 Cumulative Impacts

Based on the water usage for the Proposed Action (50.7 AF), water usage per year is expected to increase by 2.54 AF. This is 0.003 percent of the total water usage for the county of Sandoval alone (Longworth, Valdez, Magnuson, & Richard, 2013). Since this percentage of water use for the lease sale is such a small portion of the overall usage for Sandoval county alone, BLM does not expect the lease sale to have a significant impact on ground and surface water resources.

It is not possible to predict the impacts to any particular aquifer because the water is sourced from different locations for each individual project. The BLM will undertake more specific analysis of the impacts to ground water at the individual project stage when the BLM will have better information on the source of the water used for that project.

#### 4.3.4 Vegetation

##### 4.3.4.1 Direct and Indirect Effects

Basic assumptions can be made that, if drilling occurs, vegetation will be removed for drill pad construction. This is a temporary disturbance that is reduced upon interim reclamation and mitigated upon final reclamation.

##### 4.3.4.2 Potential Mitigation

Evaluation of mitigation measures for the effect on vegetation is deferred to the site specific APD stage of development. Best Management Practices would be incorporated into the Conditions of Approval.

#### 4.3.5 Invasive, Non-Native Species

##### 4.3.5.1 Direct and Indirect Effects

Any surface disturbance can increase the possibility of establishment of new populations of invasive non-native species. The likelihood of this happening at the APD stage cannot be

1516 predicted with existing information. Minimizing the potential for introduction of weeds into  
1517 developed site is a primary objective.

#### 1518 4.3.5.2 Potential Mitigation

1519 Construction equipment will be power washed or air blasted to remove soils and vegetative  
1520 materials on the equipment prior to entering the project sites. Certified noxious weed-free seed  
1521 will be used in any reclamation area. Weed-free mulches will be utilized. Specific site plans  
1522 will be developed at APD stage. Best Management Practices would be incorporated into  
1523 Conditions of Approval. Should noxious or invasive non-native weeds become established or  
1524 spread due to the proposed action, operators will be required to eliminate the population using  
1525 standard weed management practices under the direction of BLM personnel.

1526

#### 1527 4.3.6 Livestock Grazing

##### 1528 4.3.6.1 Direct and Indirect Effects

1529 The amount and location of direct and indirect effects cannot be predicted until the site-specific  
1530 APD stage of development. Rangeland improvements can be impacted by road and pad  
1531 development. In the proposed lease areas there are a number of retention dams and water  
1532 troughs. In addition there are playas with seasonal water that are secondary livestock water  
1533 areas. Placement of facilities close to water could increase potential for contamination of the  
1534 water site during construction and operations. In addition closeness to water can increase  
1535 potential for stock to use the pad areas for resting, and rubbing and potential exposure to  
1536 ethylene glycol storage and spills.

##### 1537 4.3.6.2 Potential Mitigation

1538 At the site-specific APD stage of development, watering facilities, playas and improvements will  
1539 be avoided. Roads and pads will be planned so as to prevent sediment loads and contaminants.  
1540 Cattle guards will be installed on fence lines. BLM currently consults with grazing permittees on  
1541 a site-by-site basis as part of the APD process. Best Management Practices would be  
1542 incorporated into the Conditions of Approval.

1543

#### 1544 4.3.7 Wildlife

##### 1545 4.3.7.1 Direct and Indirect Effects

1546 Should a lease be developed and surface disturbing and/or disruptive activities occur on the  
1547 parcels containing crucial big game winter range during the crucial wintering period, it could  
1548 cause impacts to wintering mule deer, pronghorn, and elk, such as causing animals to move to  
1549 less suitable winter habitat and conceivably causing fetal abortion by pregnant females. Well

pad, road, and pipeline development into areas currently void of surface disturbing or disruptive activities would result in habitat fragmentation, which, depending on the intensity of the development, vegetative cover and terrain, and could affect habitat viability.

Several Habitat Stamp Program projects have been conducted and/or constructed within the project area including vegetative treatments for the improvement of big game habitat, wildlife waters, and riparian/wetland area enclosures to exclude livestock use. If leased parcels containing such projects are developed, direct effects would include the removal, disturbance, or fragmentation of riparian areas and wetlands, removal/destruction of wildlife waters and habitat fences, and removal of vegetation on areas that have been improved using Habitat Stamp Program and other federal funds.

Activities associated with development of oil and gas resources are highly likely to lead to displacement of wildlife. Although the direct and indirect effects on specific wildlife species cannot be determined until site-specific project proposals are analyzed at the APD stage of development, operations associated with the development of oil and gas generally include: direct habitat loss due to the removal of vegetation and land clearing associated with pad, road, and infrastructure construction; increased development and use of roads within wildlife habitats; mortality of individuals due to removal of vegetation/burrows/nests/dens/roosts, vehicular collisions, and collisions with infrastructure; mortality due to drowning and contamination from open water sources on site; displacement of individuals due to noise disturbance and removal of foraging habitats; introduction and proliferation of noxious and invasive weeds; and nest abandonment and mortality of young due to physical and noise disturbance during sensitive reproductive periods.

Various parcels offered are located in close proximity to Fork Rock Mesa and Eagle Mesa, which provide habitat for raptors and migratory birds. If these lease parcels are developed, the resulting ground and noise disturbance could lead to the aforementioned effects or others depending on the species present.

#### 4.3.7.2 Potential Mitigation

To mitigate the impacts of lease development on raptors and migratory birds, the Timing Limit Stipulation: Important Seasonal Wildlife Habitat (RP-2 TLS) may be applied to these leases. In addition, site-specific wildlife resource surveys may be required at the APD stage. If a proposed activity is foreseen to have an adverse impact on other wildlife habitat, appropriate Conditions of Approval will be attached to the APD. Examples of Conditions of Approval that protect wildlife resources include fencing to exclude wildlife, adequate covers on open water sources, noise and dust abatement, and timing stipulations to protect bird nesting sites or other seasonal wildlife habitat. Mitigation measures can include:

- Locate roads as far from riparian areas and bottoms of drainages as possible and outside of riparian habitat.

- Implement road and traffic management measures, including a 25 mph limit for all roads and a ban on cell phone use while driving to enhance driving management, and encouraging carpooling for major projects.
- Install a consolidated, centralized, and closed fluid collection system to avoid environmental contamination and water-related wildlife mortalities.
- Maintain no-surface-occupancy buffers around active raptor nests.
- Implement a monitoring program for raptors and other migratory and resident birds.
- Limit pad construction to 3 acres or less; limit pad density to 1 pad per 120 acres.
- Bury all gas and water pipelines adjacent to roads; bury water pipeline distribution systems to reduce truck traffic.
- Inventory and map noxious and invasive weeds; conduct annual weed treatments; use BLM-approved seed mixes for restoring disturbed areas; conduct interim reclamation.
- Restrict rig operation to less than 2 per section within big game seclusion areas during winter; avoid construction activities or well operation during winter periods within big game winter range (Nov 15 – Apr 15).
- Drill with a closed loop (pitless) system to avoid wildlife mortalities from pits.

#### 4.3.8 Special Status Species

##### 4.3.8.1 Direct and Indirect Effects

Should a lease be developed and surface disturbing activities occur on parcels containing individuals or associated habitats of Special Status Species, a direct loss of individual's and their associated habitats is likely to occur. It is unknown at the lease stage to quantify the effects that may occur to the various Special Status Wildlife and Plant Species within the proposed action area until site specific analysis occurs and is dependent on future proposed actions within the nominated lease parcels.

##### 4.3.8.2 Potential Mitigation

Evaluation of mitigation measures for the effect on Special Status Species is deferred to the site specific APD stage of development. Best Management Practices would be incorporated into the Conditions of Approval for species that may be affected.

Survey requirements would include the following for plant species.

- Clearance surveys must be conducted by a qualified botanist.
- The area to be surveyed will include at a minimum the project area plus an additional 100 meters outside the project area.
- Clearance surveys will be conducted during the blooming season or the period in which the plant species is most easily detected as determined by the BLM.

Based on the results of the survey, conditions of approval may be applied to land use authorizations and permits that fall within the area of direct/indirect impacts or affected habitat, as appropriate. Possible mitigation strategies may include, but are not limited to:

- Avoidance/restriction of development such as locating the surface disturbance area away from the edge of occupied or suitable habitat and ideally outside of the area where indirect/direct impacts would occur;
- Minimizing the area of disturbance utilizing strategies such as but not limited to twinning, and utilizing existing disturbance and corridors;
- Dust abatement measures;
- Signs, fencing, and other deterrents to reduce human disturbance;
- Construction of well sites, roads and associated facilities outside of the blooming season;
- Specialized reclamation procedures such as, but not limited to,
  - separating soil and subsoil layers with barriers to reclaim in the correct order,
  - using a higher percentage of forbs in the reclamation seed mix to promote pollinator habitat,
  - collection of seeds for sensitive plant species' genetic preservation, grow-out, and reclamation;
- Long term monitoring of indirect/direct impacts on the species and/or habitat;
- Qualified, independent third-party contractors to provide general oversight and assure compliance with project terms and conditions during construction;
- Non-native or invasive species monitoring and control in occupied and suitable habitat;
- Complete mitigation according to the CEQ regulations 40 CFR 1508.20.

#### 4.3.9 Areas of Critical Environmental Concern

##### 4.3.9.1 Direct and Indirect Effects

The Torreon Fossil Fauna is a major collecting area for fossil mammals. Type specimens of the Torreon Fauna were originally recognized and described from this locale. A type locality is an important paleontological feature in that it represents the place at which a fossil assemblage is typically displayed and from which it derives its name. Thus, the area represents a unique and irreplaceable resource. The direct lease sale itself has no direct effect on the unique resource, however if drilling is permitted under current management prescriptions strict adherence to the ACEC protection plans must be applied.

##### 4.3.9.2 Potential Mitigation

Site-specific paleontological resource surveys would be required at the APD stage and, depending on location and nature of the proposed development and results of surveys, additional consultation could be required with Rio Puerco or State Office Paleontology Specialists. If sale lease would happen after the completion and final approval of the Rio Puerco Resource Management plan revisions, the area could be lease with No Surface Occupancy restrictions.

1661

1662 4.3.10 Recreation/Special Designations

1663 Evaluation of mitigation measures for effects on recreation resources is deferred to the site  
1664 specific APD stage of development. Best Management Practices would be incorporated into  
1665 Conditions of Approval and protective stipulations would be attached to the lease. Potential  
1666 noise impacts as a direct result of development will be short term. Long term noise impacts will  
1667 be as a result of hydrocarbon development and transportation by truck compressors, pump jacks.

1668 4.3.10.1 Direct and Indirect Effects

1669 Potential effects could occur to dispersed recreation activities such as big game hunting in small  
1670 areas but these effects cannot be determined until site-specific development proposals are  
1671 received at the APD stage.

1672 4.3.10.2 Potential Mitigation

1673 Mitigation of the effects of noise would be achieved by requiring all facilities using internal  
1674 combustion engines to have exhaust mufflers, sound barrier walls or earthen mound to quiet  
1675 noise or direction of impacts. Cumulative adverse noise impacts can be avoided by moving  
1676 facilities behind hills and away from ACEC, or other potential high use recreation areas. Further  
1677 evaluation of mitigation measures for effects on recreation is deferred to site-specific  
1678 requirements determined at the APD stage.

1679 4.3.11 Cultural Resources

1680 4.3.11.1 Direct and Indirect Effects

1681 The lease sale itself does not directly authorize surface disturbance; rather, the leaseholders are  
1682 granted future right of development to the leased mineral estate. Thus, the act of selling oil and  
1683 gas leases in itself does not have the potential to impact cultural resources. However, once  
1684 issued, a lease bestows upon its owner the “right to use so much of the lease lands as is necessary  
1685 to explore for, drill for, mine, extract, remove and dispose of the leased resource in the  
1686 leasehold” (43 CFR§ 3101.1-2) subject to specific nondiscretionary statutes and lease  
1687 stipulations.

1688 Surface disturbance associated with future reasonable foreseeable development (RFD) could affect  
1689 known historic properties, as well as yet-undiscovered historic properties on the parcels. Cultural  
1690 resources located within the proposed parcels would be subject to direct and indirect effects from  
1691 oil and gas exploration and development activities at later stages of lease development (e.g.,  
1692 ground disturbance and facilities construction). As such, identification and evaluation of these  
1693 resources on a case-by-case basis for compliance with Section 106 of the National Historic  
1694 Preservation Act (NHPA) would be required prior to project implementation or ground-  
1695 disturbing activities.

Reasonably foreseeable development resulting from leasing within the proposed area has the potential to impact known and as yet undiscovered historic properties within the parcels, both directly and indirectly at later stages of lease development. Potential direct effects from oil and gas exploration and development activities are physical disturbance of a site from the construction of a well pad, associated access roads, or associated infrastructure like pipelines. Potential indirect effects include changes to the landscape which result in impacts to a site's setting, feeling, or association. Given the types of cultural resources known and expected in the area, such indirect effects would likely apply only to traditional cultural properties, sacred sites, and/or traditional use areas. Based on the Reasonable Forseeable Development projected for the area, a total of 30 wells is estimated to be constructed over the approximate 41,000 acres in the proposed lease sale parcels. As presented in Chapter 1.6.1 an average disturbance area of a well pad and access road is 12 acres, resulting in a total of 360 acres of disturbance associated with well pads for the lease sale parcels.

#### 4.3.11.2 Potential Mitigation

Regarding direct effects, for many parcels these effects can be avoided because the parcels are large or moderate sized, with expected site densities that can easily accommodate the expected acreage of disturbance without adverse effects. For those parcels where there are sites or traditional cultural properties, sacred sites, and/or traditional use areas sensitive to indirect effects, the parcels are sufficiently large and topographically complex that these effects can be avoided through judicious placement of well pads.

All parcels offered under the proposed and preferred alternatives would be subject to the standard National WO-NHPA Lease Stipulation (Appendix 4). This lease stipulation requires additional cultural resources analyses pursuant to Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 306108, including identification, effects assessment, consultation, and if necessary, resolution of adverse effects.

A second stipulation for cultural resource protection would be attached to all parcels leased. NM-11-LN (Cultural Resources) (Appendix 4) requires compliance with Section 106 of the NHPA and Executive Order (EO) 13007. This stipulation notifies the lease holder that known and as yet unidentified cultural properties may be present within the lease area, that compliance with Section 106 and EO 13007 will be at the lessee's expense, that additional tribal consultation will be required, that time frames may be extended to carry out such compliance, and that BLM could require modifications to or disapprove proposed activities that are likely to adversely affect cultural properties for which no mitigation measures are possible.

While the above stipulations would be attached to all leases to protect known and as yet unknown historic properties, traditional cultural properties, and/or sacred sites, there are additional stipulations that would be attached to three of the proposed lease parcels to protect already identified historic properties, Traditional Cultural Properties, and/or sacred sites. Lease Stipulation RP-10 (No Surface Occupancy) would be attached to a portion of one proposed lease

1737 parcel to protect a historic cemetery. Lease Stipulation RP-6 (Controlled Surface Use) would be  
1738 attached to portions of two proposed lease parcels to protect known sensitive properties.

1739 Meeting lease stipulation requirements is a critical component of BLM approving any future  
1740 proposed development. All stipulations will be enforced during any future authorizations to  
1741 conduct exploration or operational activities under a lease. Through the cultural resource  
1742 protection stipulations attached to all leases, BLM has the authority to require modification of,  
1743 or disapprove, parcel development plans if cultural resource conflicts cannot be satisfactorily  
1744 resolved. This gives BLM the authority to control future development to avoid adverse effects,  
1745 including, but not limited to, those that would cause a degradation of setting and other indirect  
1746 effects.

1747  
1748 Based on the results of the records review and other factors detailed above, the Rio Puerco Field  
1749 Office has made a Determination of “No Effect” for the undertaking based on the attachment of  
1750 National Stipulation WO-NHPA and Special Cultural Resource Lease Notice NM-11-LN to all  
1751 parcels, and the application of Stipulation RP-NSO-10 (No Surface Occupancy) to a portion of  
1752 one proposed lease parcel to protect an historic cemetery, and application of Stipulation RP-6 to  
1753 portions of two lease parcels to protect known sensitive sites.

1754

#### 1755 4.3.12 Native American Religious Concerns

##### 1756 4.3.12.1 Direct and Indirect Effects

1757 Although the act of issuing oil and gas leases does not directly authorize exploration,  
1758 development, or production, or any other related ground-disturbing activities, the potential exists  
1759 for future such activities on leased parcels to impact Native American traditional cultural  
1760 properties, sacred sites, and traditional use areas. Such effects can be difficult to effectively  
1761 avoid, minimize, or mitigate; however, impacts can be minimized and/or mitigated when  
1762 affected tribes provide input and actively and fully participate in the decision making process.

1763 Based on the Reasonable Foreseeable Development projected for the area, a total of 30 wells is  
1764 estimated to be constructed over the approximate 41,000 acres in the proposed lease sale parcels.  
1765 As presented in Chapter 1.6.1 an average disturbance area of a well pad and access road is 12  
1766 acres, resulting in a total of 360 acres of disturbance associated with well pads for the lease sale  
1767 parcels.

##### 1768 Dark Night Sky Environmental Impacts

1769 The proposed action will not directly permit ground disturbance; therefore, it is not expected to  
1770 have an effect on night skies. However, based on the RFD it is estimated, based on historical  
1771 data, that potential production will disturb an estimated 360 acres throughout the approximately  
1772 forty thousand proposed lease area. What the impacts to Night Skies will be from this level of  
1773 potential product are difficult to calculate since the BLM does not set a standard for artificial sky



1774 glow affects. It can be assumed that there may be potential aesthetic impacts to recreational  
1775 visitors and Navajo Chapter members enjoying or conducting cultural ceremonies associated  
1776 with Night Skies.

1777 4.3.12.2 Potential Mitigation

1778 The standard WO-NHPA stipulation (Appendix 4) attached to all parcels states that BLM will  
1779 not approve any ground-disturbing activities until it conducts its tribal consultation obligations.  
1780 BLM may require modification to exploration or development proposals or disapprove any  
1781 activity that is likely to result in adverse effects that cannot be successfully avoided, minimized,  
1782 or mitigated. If projects are proposed on any leased parcel in the future, each would be analyzed  
1783 under project-specific NEPA analysis. At that time the BLM would consult with the tribes and  
1784 site-specific mitigation measures would be attached as Conditions of Approval (COAs).

1785 In addition to the national WO-NHPA stipulation, a second stipulation for cultural resource  
1786 protection would be attached to all parcels leased. NM-11-LN (Cultural Resources) (Appendix  
1787 4) requires compliance with Section 106 and Executive Order 13007. This stipulation notifies  
1788 the lease holder that known and as yet unidentified cultural properties may be present within the  
1789 lease area, that compliance with Section 106 and EO 13007 will be at the lessee's expense, that  
1790 additional tribal consultation will be required, that time frames may be extended to carry out  
1791 such compliance, and that BLM could require modifications to or disapprove proposed activities  
1792 that are likely to adversely affect cultural properties for which no mitigation measures are  
1793 possible.

1794 While the above stipulations would be attached to all leases to protect known and as yet  
1795 unknown historic properties, traditional cultural properties, and/or sacred sites, there is an  
1796 additional stipulation that would be attached to two of the proposed lease parcels to protect  
1797 already identified historic properties, traditional cultural properties, sacred sites, and/or  
1798 traditional use areas. Lease Stipulation RP-6 (Controlled Surface Use) would be attached to  
1799 portions of two proposed lease parcels to protect known sensitive properties.

1800 Enforcement of all stipulations during any future authorizations to conduct exploration or  
1801 operational activities under a lease will result in no effects to Native American Religious  
1802 Concerns. Through the cultural resource protection stipulations attached to all leases, BLM  
1803 has the authority to require modification of, or disapprove, parcel development plans if cultural  
1804 resource conflicts cannot be satisfactorily resolved. This gives BLM the authority to control  
1805 future development to avoid adverse effects, including, but not limited to, those that would  
1806 cause a degradation of setting and other indirect effects.  
1807

1808 4.3.13 Environmental Justice

1809 4.3.13.1 Direct and Indirect Effects

1810 Indirect effects could include effects due to overall employment opportunities related to the oil  
1811 and gas and service support industry in the region as well as the economic benefits to state and  
1812 county governments related to royalty payments and severance taxes. Other effects could  
1813 include a small increase in activity and noise disturbance in areas used for grazing, wood  
1814 gathering, or hunting. However, these effects would apply to all public land users in the project  
1815 area.

1816 4.3.13.2 Potential Mitigation

1817 Mitigation of potential negative effects, such as noise and surface disturbance is addressed in  
1818 current regulations. Should drilling occur, specific mitigation measures, such as noise abatement,  
1819 will be considered at the APD stage.

1820

1821 4.3.14 Mineral Resources

1822 4.3.14.1 Direct and Indirect Effects

1823 The amount and location of direct and indirect effects cannot be predicted until the site specific  
1824 APD stage of development. The lease parcels do not appear to present any conflict with the  
1825 development of other mineral resources such as coal, sand, or gravel.

1826 4.3.14.2 Potential Mitigation

1827 Evaluation of mitigation measures for effects on mineral resources is deferred to the site specific  
1828 APD stage of development.

1829

1830 4.3.15 Paleontology

1831 4.3.15.1 Direct and Indirect Effects

1832 Although the amount and location of direct and indirect effects cannot be predicted until the site-  
1833 specific APD stage of development, the parcels offered are in a PFYC Class 5 the geological  
1834 formations present have produced important fossils.

1835 4.3.15.2 Potential Mitigation

1836 Evaluation of mitigation measures for effects on paleontological resources is deferred to the site  
1837 specific APD stage of development. Best Management Practices would be incorporated into

1838 Conditions of Approval and protective stipulations would be attached to the lease. Stipulation  
1839 RP-11-CSU may be applied to protect potential fossil resources on identified parcels.

1840 In the event that a paleontological resource is identified, the lessee shall protect the discovery  
1841 from damage or looting and will notify the BLM Authorized Officer prior to disturbing the site.  
1842 If the discovery is made during construction activities, further disturbance will be halted and the  
1843 Authorized Officer will be notified. The Authorized Officer will evaluate said discovery after  
1844 being notified and appropriate measures to mitigate adverse effects to significant paleontological  
1845 resources will be determined by the Authorized Officer. Upon approval of the Authorized  
1846 Officer, the operator will be allowed to continue construction through the site, or will be given  
1847 the choice of either (1) following the Authorized Officer's instructions for stabilizing the fossil  
1848 resource in place and avoiding further disturbance to the fossil resource, or (2) following the  
1849 Authorized Officer's instructions for mitigating impacts to the fossil resource prior to continuing  
1850 construction through the project area.

#### 1851 4.4 Cumulative Effects

1852 The NMSO manages approximately 41 million acres of Federal mineral estate. Of the 41 million  
1853 acres, 35 million acres are available for oil and gas leasing. Approximately 16% of the 35 million  
1854 acres is currently leased (73% of the leases are in production and 63% of the lease acres are in  
1855 production). The NMSO received 236 parcel nominations (178,793 acres) for consideration in  
1856 the February 2014 Oil & Gas Lease Sale, and is proposing to lease 106 (73,642 acres) of the 236  
1857 parcels. If these 106 parcels were leased, the percentage of Federal minerals leased would change  
1858 by 1%. The Carlsbad, Farmington, Las Cruces, Oklahoma (Kansas, Texas and Oklahoma), Rio  
1859 Puerco and Roswell Field Office parcels are analyzed under separate EAs.

1860 **Table 4.9 Actual - Acres of Federal Minerals/Acres Available/Acres Leased:**

State	Federal O&G Mineral Ownership	Acres Available	Acres Leased	Percent Leased
KS	744,000	614,586	125,091	20%
NM	34,774,457	29,751,242	4,839,255	16%
OK	1,998,932	1,668,132	324,072	19%
TX	3,404,298	3,013,207	425,511	14%
Totals/Average	40,921,687	35,058,167	5,713,929	16%

1861  
1862 This environmental assessment (EA) tiers to and incorporates by reference the information and  
1863 analysis contained in the Resource Management Plans. The RMPs designated federal minerals  
1864 as open for continued oil and gas development and leasing under Standard Terms and Conditions  
1865 and described specific stipulations that would be attached to new leases offered in certain areas.  
1866 The parcels to be offered in the February 2014 sale are within areas open to oil and gas leasing.

1867 Currently there are 112 oil and gas leases covering approximately 107,763 acres in the Rio  
1868 Puerco Field Office. These leases have a total of 170 producing, abandoned, and shut-in wells.

Approximately 260 acres, or 0.24% of the leased area, are disturbed. If a parcel is leased and developed through drilling, a separate environmental document would be prepared. If full field development were to occur, additional NEPA analysis addressing cumulative impacts would be required. Impacts from development would remain on the landscape until final abandonment and reclamation of facilities occurs at some unknown time in the future. Ongoing mitigation and reclamation procedures would continue to be used to limit effects.

It is unknown when, where or if future well sites or roads might be proposed within the proposed lease sale areas. Also, at the time of this review, it is unknown whether a parcel will be sold and a lease even issued. Analysis of projected surface disturbance impacts, should a lease be developed, was estimated based on potential well densities listed in the Reasonable Foreseeable Development Scenario used as the basis for the 1991 PRMP Amendment/FEIS (7). Detailed site-specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD).

#### 4.4.1 Air Quality

The small increase in emissions that could result from approval of the proposed action would not result in the area exceeding the NAAQS for any criteria pollutant. In October 2012, EPA regulations that require control of VOC emissions from oil and gas development became effective. These regulations will reduce VOC emissions from oil and gas exploration and production that contribute to ozone concentrations. Emission from any development of the leases is not expected to impact the 8-hour average ozone concentrations, or any other criteria pollutants in the area.

#### 4.4.2 Climate Change

This section incorporates an analysis of the contributions of the proposed action to GHG emissions and a general discussion of potential impacts to climate.

The EPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2010, total U.S. GHG emissions were almost 7 billion (6,821.8 million) metric tons and that total U.S. GHG emissions have increased by 10.5% from 1990 to 2010 (EPA, 2012b). Emissions increased from 2009 to 2010 by 3.2.0% (13.5 million metric tons CO<sub>2</sub><sup>e</sup>). The primary causes of this increase were an increase in economic output which increased energy consumption and warmer summer conditions which resulted in an increase in electricity demand for air conditioning (EPA, 2012b).

On-going scientific research has identified the potential effects of anthropogenic GHG emissions such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and several trace gasses; changes in biological carbon sequestration; and other changes due to land management activities on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although natural GHG atmospheric concentration levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and

1908 burning of fossil carbon sources have caused GHG concentrations to increase.

1909

1910 The incremental contribution to global GHG gases from the proposed action cannot be translated  
1911 into effects on climate change globally or in the area of this action. As oil and gas production  
1912 technology continues to improve, and because of the potential development of future regulation  
1913 or legislation, one assumption is that reductions in the rate or total quantity of GHG emissions  
1914 associated with oil and gas production are likely. As stated in the direct/indirect effects section  
1915 under climate change, the assessment of GHG emissions and the resulting impacts on climate is  
1916 an ongoing scientific process. It is currently not feasible to know with certainty the net impacts  
1917 from the proposed action on global or regional climate—that is, while BLM actions may  
1918 contribute to the climate change phenomenon, the specific effects of those actions on global  
1919 climate are speculative given the current state of the science. Therefore, the BLM does not have  
1920 the ability to associate an action’s contribution in a localized area to impacts on global climate  
1921 change. Further, an IPCC assessment states that difficulties remain in attributing observed  
1922 temperature changes at smaller than continental scales. It is currently beyond the scope of  
1923 existing science to predict climate change on regional or local scales resulting from specific  
1924 sources of GHG emissions.

1925

1926 Currently, global climate models are inadequate to forecast local or regional effects on resources  
1927 (IPCC, 2007; CCSP, 2008). However, there are general projections regarding potential impacts  
1928 to natural resources and plant and animal species that may be attributed to climate change from  
1929 GHG emissions over time; however these effects are likely to be varied, including those in the  
1930 southwestern United States (Karl et al., 2009). For example, if global climate change results in a  
1931 warmer and drier climate, increased particulate matter impacts could occur due to increased  
1932 windblown dust from drier and less stable soils. Cool season plant species’ spatial ranges are  
1933 predicted to move north and to higher elevations, and extinction of endemic  
1934 threatened/endangered plants may be accelerated. Due to loss of habitat or competition from  
1935 other species whose ranges may shift northward, the population of some animal species may be  
1936 reduced or increased. Less snow at lower elevations would likely impact the timing and quantity  
1937 of snowmelt, which, in turn, could impact water resources and species dependent on historic  
1938 water conditions (Karl et al., 2009).

1939

1940 The Inventory of New Mexico Greenhouse Gas Emissions: 2000-2007 estimates that 13.9  
1941 million metric tons of GHGs from the natural gas industry and 1.9 million metric tons of GHGs  
1942 from the oil industry were emitted in 2007 as a result of oil and natural gas production,  
1943 processing, transmission and distribution. Overall, greenhouse gas emissions in New Mexico  
1944 decreased slightly from 2000 to 2007 (NMED, 2010). As of 2008, there were 23,196 oil wells  
1945 and 27,778 gas wells in New Mexico (NMOCD, 2010b).<sup>1</sup>

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<sup>1</sup> In 2000, approximately 17 million metric tons and 2.3 million metric tons were respectively attributed to natural gas and oil activities. As of 2002, the Inventory indicates that there approximately 21,771 oil wells and 23,261 gas wells in the State. Significant uncertainties remain with respect to: the quality of historical field data, processing, and pipeline use of natural gas, does not factor in reclaimed wells and total number of new wells drilled per year; CO2 emissions from enhanced oil recovery, which have not been estimated; and refinery fuel use-EIA indicates less than half the refinery fuel use as indicated by refinery permit data.

1946  
1947 When compared to the GHG emission estimates from the total number of oil and gas wells in the  
1948 State, the average number of oil and gas wells drilled annually in the Field Office and associated  
1949 GHG emission levels represent an incremental contribution to the total regional and global GHG  
1950 emission levels. The number of oil and gas wells that would eventually result from the proposed  
1951 action would therefore likely represent an even smaller incremental contribution to GHGs  
1952 emissions on a global scale.

1953  
1954 The impact of climate change on BLM resources depends upon the location of the affected  
1955 resource, its vulnerability and resiliency to change, and its relationship to the human  
1956 environment. There will be positive and negative impacts of climate change, even within a  
1957 single region. For example, warmer temperatures may bring longer growing seasons in some  
1958 regions, benefiting farmers who can adapt to new conditions, but potentially harming native  
1959 plant and animal species. In general, the larger and faster the changes in climate are, the more  
1960 difficult it will be for human and natural systems to adapt.

1961  
1962 Based on current assumptions for climate change, New Mexico could see effects to water  
1963 quantity, quality, and seasonal availability; agriculture and grazing; disease and pest outbreaks;  
1964 shifting of seasons; shifts in plant and animal population, range, species diversity, and migration  
1965 patterns; forest quality; and frequency, duration, and location of extreme weather events. Within  
1966 the RPFO itself, there may be local variations.

1967  
1968 Climate change also is likely to exacerbate the effects of natural and altered disturbance regimes,  
1969 including wildfire, insect outbreaks, flooding, and erosion, across all New Mexico's habitat types  
1970 and may prompt abrupt ecological changes. This is particularly true in ecosystems such as  
1971 grasslands, riparian areas, and forests where the effects of past management and land use change  
1972 are substantial (McCarty, 2008).

1973  
1974 A number of activities contribute to the phenomenon of climate change, including emissions of  
1975 GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires,  
1976 activities using combustion engines, changes to the natural carbon cycle, and changes to  
1977 radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained  
1978 climatic impact over different temporal scales due to their differences in global warming  
1979 potential (described above) and life spans in the atmosphere.

## 1980 **5.0 Description of Mitigating Measures and Residual Impacts**

1981 Effects of the lease sale will be mitigated by attaching the Oil and Gas Leasing Stipulations to  
1982 the lease parcels. The Albuquerque District Office's Surface Use and Occupancy Requirements,  
1983 Conditions of Approval, and the Rio Puerco Field Office's Special Leasing Stipulations, which  
1984 are in place at the New Mexico State Office, will provide adequate mitigation for all lease  
1985 parcels.

1986 Direct, indirect, cumulative and residual impacts of leasing and lease development are generally  
 1987 described in the approved Resource Management Plans and Record of Decisions. An  
 1988 environmental analysis will be prepared on a case-by-case basis upon receipt of future  
 1989 subsequent actions.

1990 **6.0 Consultation/Coordination**

1991 This section lists individual resource specialists located within the District as well as other  
 1992 individuals/agencies who were contacted during the development of this document.

1993 **6.1 Persons/Agencies Consulted**

1994 This section includes individuals or organizations that were contacted during the development of  
 1995 this document. Summary of contacts made during preparation of this document can be found in  
 1996 appendix 8.

1997 **6.2 List of Preparers**

1998 This section lists the Bureau of Land Management Personnel involved in completion of this  
 1999 environmental assessment.

2000 **Table 6.1 List of preparers. All preparers are staff of the Bureau of Land Management, Albuquerque District**  
 2001 **Office.**

Name	Title	Role
Angel Martinez	Acting Field Manager	Coordinator / Writer/ Planning and Environmental Coordinator
Lucas Vargo	Surface and Reclamation Specialist/ EPS	Lead
Kristen Long	Planning and Environmental Coordinator	Coordinator (July 2- August 17, 2018)
Alec Bryan	Range	Specialist
Dawn Chavez	GIS	Specialist
Calvin Parson	Geologist/ Hazmat Coordinator	Specialist
Pam Reed	Realty	Specialist
Sean Daugherty	Paleontologist	Specialist
David Mattern	Hydrologist	Specialist

Name	Title	Role
Gretchen Obenauf	Archeologist	Cultural Resources and Native American Religious Concerns
Josh Freeman	Biologist	Specialist
Jennifer Merino	Outdoor Recreation Planner	Specialist

2002

2003 6.4 Authorities

2004 Code of Federal Regulations (CFR)

2005 40 CFR All Parts and Sections inclusive *Protection of Environment*, Revised as of July 1,  
2006 2001.

2007 43 CFR, All Parts and Sections inclusive - *Public Lands: Interior*. Revised as of October 1,  
2008 2000.

2009 Federal Cave Resources Protection Act of 1988 (102 Stat. 4546; 16 U.S.C. 4301)

2010 U.S. Department of the Interior, Bureau of Land Management and Office of the Solicitor  
2011 (editors). 2001. *The Federal Land Policy and Management Act*, as amended. Public Law 94-  
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2013



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2180 **APPENDIX 2: Nominated Parcel List**

2181 Nominated Parcels for Rio Puerco (Albuquerque) for December 2018 Oil and Gas Lease Sale

2182

2183 **NM-201812-072 2005.950 Acres**

2184 T.0200N, R.0040W, 23 PM, NM

2185 Sec. 001 LOTS 1-4;

2186 001 S2N2,S2;

2187 002 S2N2SW,S2SW,S2NWSE,N2SWSE

2188 011 ALL;

2189 012 ALL;

2190

2191 **NM-201812-073 2080.000 Acres**

2192 T.0200N, R.0040W, 23 PM, NM

2193 Sec. 013 ALL;

2194 014 E2;

2195 023 ALL;

2196 024 N2,SW;

2197

2198 **NM-201812-074 792.920 Acres**

2199 T.0200N, R.0040W, 23 PM, NM

2200 Sec. 017 N2;

2201 018 LOTS 1-4

2202 018 NE,E2W2;

2203 018 LESS S2SESENE;

2204

2205 **NM-201812-075 640.000 Acres**

2206	T.0200N, R.0040W, 23 PM, NM
2207	Sec. 019 NE;
2208	020 N2;
2209	021 NW;
2210	
2211	<b>NM-2018-12-076 1424.620 Acres</b>
2212	T. 0200N, R. 0040W, 23 PM, NM
2213	Sec. 019 LOTS 3,4;
2214	019 E2SW;
2215	030 LOTS 1-4;
2216	030 E2, E2W2;
2217	031 LOTS 1-4;
2218	031 E2, E2W2;
2219	
2220	<b>NM-201812-077 2560.000 Acres</b>
2221	T.0200N, R.0040W, 23 PM, NM
2222	Sec. 025 ALL;
2223	026 ALL;
2224	035 ALL;
2225	036 ALL;
2226	
2227	<b>NM-201812-078 1280.000 Acres</b>
2228	T.0200N, R.0040W, 23 PM, NM
2229	Sec. 027 ALL;
2230	028 NW,S2;

2231        029 SE;  
2232  
2233    **NM-201812-079        800.000 Acres**  
2234        T.0200N, R.0040W, 23 PM, NM  
2235        Sec. 033 S2;  
2236        034 W2,SE;  
2237  
2238    **NM-201812-080        2041.680 Acres**  
2239        T.0210N, R.0040W, 23 PM, NM  
2240        Sec. 001 E2SE,SWSE;  
2241        002 LOTS 1-4;  
2242        002 S2N2,S2;  
2243        011 ALL;  
2244        012 ALL;  
2245  
2246    **NM-201812-081        2459.040 Acres**  
2247        T.0210N, R.0040W, 23 PM, NM  
2248        Sec. 003 LOTS 5-8;  
2249        003 S2N2,S2;  
2250        004 LOTS 5-8;  
2251        004 S2N2,S2;  
2252        009 ALL;  
2253        010 ALL;  
2254  
2255



2256     **NM-201812-082     2433.020 Acres**

2257     T.0210N, R.0040W, 23 PM, NM

2258     Sec. 005   LOTS 5-8;

2259     005   S2N2,S2;

2260     006   LOTS 8-14;

2261     006   S2NE,SENE,E2SW,SE;

2262     007   LOTS 1-4;

2263     007   E2,E2W2;

2264     008   ALL;

2265

2266

2267     **NM-201812-083     1680.000 Acres**

2268     T.0210N, R.0040W, 23 PM, NM

2269     Sec. 013   N2,W2SW;

2270     014   ALL;

2271     023   ALL;

2272

2273     **NM-201812-084     1923.760 Acres**

2274     T.0210N, R.0040W, 23 PM, NM

2275     Sec. 018   LOTS 1-4;

2276     018   E2,E2W2;

2277     019   LOTS 1-4;

2278     019   E2,E2W2;

2279     020   ALL;

2280

2281     **NM-201812-085     1280.000 Acres**

2282     T.0210N, R.0040W, 23 PM, NM

2283     Sec. 021   ALL;

2284     022   ALL;

2285

2286     **NM-201812-086     480.000 Acres**

2287     T.0210N, R.0040W, 23 PM, NM

2288     Sec. 025   E2,SW;

2289

2290     **NM-201812-087     1680.000 Acres**

2291     T.0210N, R.0040W, 23 PM, NM

2292     Sec. 027   W2,N2SE;

2293     028   ALL;

2294     029   ALL;

2295

2296     **NM-201812-088     961.880 Acres**

2297     T.0210N, R.0040W, 23 PM, NM

2298     Sec. 030   LOTS 1-4;

2299     030   E2,E2W2;

2300     031   E2;

2301

2302     **NM-201812-092     1279.840 Acres**

2303     T.0210N, R.0050W, 23 PM, NM

2304     Sec. 001   LOTS 1-4;

2305     001   S2N2,S2;

2306        012 ALL;  
2307  
2308    **NM-201812-093        320.000 Acres**  
2309        T.0210N, R.0050W, 23 PM, NM  
2310        Sec. 002 SW;  
2311        003 SE;  
2312  
2313    **NM-201812-094        161.060 Acres**  
2314        T.0210N, R.0050W, 23 PM, NM  
2315        Sec. 004 LOTS 1-2;  
2316        004 S2NE;  
2317  
2318    **NM-201812-095        958.200 Acres**  
2319        T.0210N, R.0050W, 23 PM, NM  
2320        Sec. 005 LOTS 1,2;  
2321        005 S2NE,S2;  
2322        006 LOTS 3-7;  
2323        006 SENW,E2SW,SE;  
2324  
2325    **NM-201812-096        800.000 Acres**  
2326        T.0210N, R.0050W, 23 PM, NM  
2327        Sec. 008 S2;  
2328        009 E2,SW;  
2329  
2330    **NM-201812-097        1280.000 Acres**

2331	T.0210N, R.0050W, 23 PM, NM
2332	Sec. 010 ALL;
2333	011 ALL;
2334	
2335	<b>NM-201812-098 1920.000 Acres</b>
2336	T.0210N, R.0050W, 23 PM, NM
2337	Sec. 013 ALL;
2338	014 ALL;
2339	015 ALL;
2340	
2341	<b>NM-201812-099 1440.400 Acres</b>
2342	T.0210N, R.0050W, 23 PM, NM
2343	Sec. 017 E2,NW;
2344	018 LOTS 3-4;
2345	018 E2SW,SE;
2346	019 LOTS 3,4;
2347	019 NE,E2SW;
2348	020 E2;
2349	
2350	<b>NM-201812-100 2400.000 Acres</b>
2351	T.0210N, R.0050W, 23 PM, NM
2352	Sec. 023 ALL;
2353	024 ALL;
2354	025 ALL;
2355	026 W2,SE;

2356

2357    **NM-201812-101      1280.000 Acres**

2358        T.0210N, R.0050W, 23 PM, NM

2359        Sec. 027   ALL;

2360            028   ALL;

2361

2362    **NM-201812-102      1160.000 Acres**

2363        T.0210N, R.0050W, 23 PM, NM

2364        Sec. 029   ALL;

2365            032   W2,W2E2,SESE;

2366

2367    **NM-201812-103      640.000 Acres**

2368        T.0210N, R.0050W, 23 PM, NM

2369        Sec. 033   ALL;

2370

2371    **NM-201812-104      640.000 Acres**

2372        T.0210N, R.0050W, 23 PM, NM

2373        Sec. 035   ALL;

2374

2375

2376

2377

2378

2379

2380 **APPENDIX 3: Oil and Gas Lease Stipulations**

2381

2382 6.5 New Mexico Stipulations

2383

2384 NM 1 THRU 3 (None)

2385

2386 NM-4 ROW Material Site Right of Way

2387

2388 NM-5 White Sands Safety Evacuation Area

2389

2390 NM-6-NSO NSO - Continental Divide Trail

2391

2392 NM-7-NL NO LEASING -Wilderness Protection (Deleted – no such stip)

2393

2394 NM-8-LN Coal Reserves (applied after review)

2395

2396 NM-9-NSO NSO - Unit Participation/Pooling Stipulation

2397

2398 NM-10 Drainage

2399

2400 NM-11-LN LEASE NOTICE - Special Cultural Resource (2/9/04)

2401

2402 NM-12-NSO No Surface Occupancy – Occupied Structures & Dwellings  
2403 (02/06)

2404

2405 3500-1 Powersite Stipulation (FERC)

2406		
2407	PLS-1	Protective Leasing Stipulation (drainage)
2408		
2409	WO-ESA (Sec 7)	Endangered Species Act –Sec 7 Consultation
2410		
2411	WO-BOR-7	NSO – Until Section 7 consultation is completed
2412		Use only on BOR lands where Sec 7 consultation is
2413		required
2414		
2415		
2416	6.6 RIO PUERCO STIPULATIONS (1986 RMP AS AMENDED)	
2417		
2418	RP-1 TLS	TIMING LIMITATION STJPULATION - Important Seasonal
2419		Wildlife Habitat – (July 2 thru January 31)
2420		
2421	RP-2 TLS	TIMING LIMITATION STIPULATION - Important Seasonal
2422		Wildlife Habitat – (May 15 thru November 15)
2423		
2424	RP-3 NSO	NO SURFACE OCCUPANCY - Cultural Resources and
2425		Aviation Facilities
2426		
2427	RP-4 NSO	NO SURFACE OCCUPANCY - Gas Storage Facility
2428		
2429	RP-5 CSU	CONTROLLED SURFACE USE -Designated Critical Area
2430		of Environmental Concern (ACEC)
2431		
2432	RP-6	National Register of Historic Places

2433

2434 RP-7 Santa Ana Exchange (Contact Rio Puerco)

2435

2436 RP-8 TLS TIMING LIMITATION STIPULATION -Protection of  
2437 recreational wildlife and cultural values – (February 1, to July 1)

2438

2439	RP-9 CSU	CONTROLLED SURFACE USE - Protection of
2440		recreational, wildlife and cultural values (Canon Jarido)

2441

2442 RP-10 NSO NO SURFACE OCCUPANCY - Location contains a Church and  
2443 Cemetery

2444

2445 RP-11 CSU CONTROLLED SURFACE USE - Torreon Fossil ACEC

2446

2447



## APPENDIX 4: Fluid Mineral Special Lease Stipulations

### 1.1 Background

When the BLM offers a parcel of land for lease, the BLM can attach special lease stipulations that augment the protections offered by the standard lease terms and conditions (BLM Form 3100-11). A lease stipulation is an enforceable term of the lease contract and supersedes any inconsistent provisions of the standard lease form. Only lease stipulations that have been reviewed and approved via the land use planning process may be attached to fluid mineral leases. The stipulations currently used by the RPFO are described in the 1992 Oil and Gas Amendment. For the revision of this RMP, resource specialists have revised the current stipulations in order to provide protection of other resources and resource uses.

#### 1.1.1 Standard Lease Terms and Conditions

Standard lease terms and conditions can be found on the “Offer to Lease and Sale for Oil and Gas” form, (BLM Form 3100-11), and in 43 CFR Part 3101—Issuance of Leases. The provisions most relevant to surface management of fluid mineral development are the following:

- 43 CFR Part 3101.1-2: “...measures shall be deemed consistent with lease rights granted provided that they do not: require relocation of proposed operations by more than 200 meters; require that operations be sited off the leasehold; or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year.”
- Sec. 6, BLM Form 3100-11: “Lessee must conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users...”
- Sec. 12, BLM Form 3100-11: “At such time as all or portions of this lease are returned to the lessor, lessee must...reclaim the land as specified by lessor...”

#### 1.1.2 Types of Lease Stipulations

A “no surface occupancy,” or NSO, stipulation precludes any surface disturbance within the area specified in the stipulation. The fluid minerals within the lease may be accessed by directional drilling from areas outside the leasehold that are open to surface occupancy. NSO stipulations are considered to be a major constraint on fluid mineral leasing and development.

A “controlled surface use,” or CSU, stipulation allows surface disturbance within the specified area, but requires the lessee to comply with specific measures beyond standard terms and conditions in order to provide adequate protection for other resources or resource uses. The type of specific requirements will vary depending upon the resource being protected and are described in the text of each stipulation. CSU stipulations are a moderate constraint on fluid mineral leasing and development.

A “timing limit stipulation,” or TLS, precludes surface-disturbing activities during a particular time frame in order to protect a particular resource. The specified time frame and the location for

which the time frame applies will vary depending upon the resource being protected. TLS stipulations are a moderate constraint on fluid mineral leasing and development. Overlapping moderate constraints (CSU or TLS) are also considered a major constraint to fluid mineral leasing and development.

A “lease notice,” or LN, may also be attached to a lease, but is only informational and has no legal consequences. A LN may be attached to a lease by the authorized officer to “convey certain operational, procedural, or administrative requirements relative to lease management within the terms and conditions of the standard lease form.” (43 CFR Part 3101.1-3)

#### 1.1.3 Waivers, Exceptions and Modifications

Waivers, exceptions, and modifications provide a means by which adaptive management can be applied to oil and gas leasing and development. A stipulation may be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if proposed operations would not cause unacceptable impacts (43 CFR Part 3101.1-4). The stipulations listed in a land use plan should include the criteria for granting waivers, exceptions, or modifications, and whether public review is required. Waivers, exceptions, and modifications are described in detail in IM-2008-032, Exceptions, Waivers, and Modifications of Fluid Minerals Stipulations and Conditions of Approval, and Associated Rights-of-way Terms and Conditions.

Exception: A one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver.

Modification: A change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

Waiver: A permanent exemption from a lease stipulation. The stipulation no longer applies anywhere in the leasehold.

In the past, waivers, exceptions, and modifications have been used to reduce restrictions on fluid mineral development. However, in accordance with IM-2010-117, Oil and Gas Leasing Reform, waivers, exceptions, and modifications should also now be used to allow for increased levels of resource protection, should changing circumstances warrant it. The stipulations below reflect this change.

It is the responsibility of the lessee to provide any surveys, environmental analyses, protection plans, or similar products required in lease stipulations. Any such products should be completed by an individual qualified to carry out the needed analysis.

#### 1.1.4 Existing Leases

The lease stipulations proposed here cannot be retroactively applied to existing leases, although best management practices and/or conditions of approval may be utilized to address and minimize impacts to resources of concern. Leases expire after 10 years if not extended by production of oil or gas (or other various circumstances). If a lease expires and the parcel is offered again, the proposed lease stipulations approved in the RMP revision would apply. Leases issued prior to the approval of the revised RPFO RMP may have stipulations attached that came from the 1992 Oil and Gas Amendment. Those lease stipulations, if attached, will continue to apply to those leases until lease expiration.

## 1.2 RPFO Proposed Lease Stipulations

Lease stipulations proposed in Proposed Action are listed below. For a complete description of the lease stipulations in No Action, please see the 1992 Oil and Gas Amendment.

### 1.2.1 Wildlife and Sensitive Species Stipulations

#### 1.2.1.1 CSU—Designated Special Status Species Measures

Surface-disturbing and disruptive activities may be controlled or excluded within 0.25 mile of special status species populations or the activity delayed 90 days within identified habitat (including designated critical habitat for threatened and endangered species) or active reproductive grounds of species with current or proposed federal, state, or BLM protection.

**Objective:** To maintain habitat for designated special status species and comply with the Endangered Species Act.

**Exception:** The authorized officer may grant an exception if an environmental review determines that the action, as proposed or conditioned, would not impair the function or utility of the site for current or subsequent use by designated sensitive species. The exception may apply to either the boundary of the affected area or the duration of the restriction if an environmental analysis determines that the special status species use an area smaller, or larger, than the 0.25 mile radius, or if the species are present for a period shorter or longer than 90 days. The burden of providing information to support this determination will be borne by the lessee.

**Modification:** The authorized officer may modify the area subject to the stipulation, or the duration of the stipulation, if an environmental analysis finds that a portion of the CSU area is nonessential, or that the proposed action could be conditioned so as not to impair the function or utility of the site for current or subsequent use by special status species. This modification could either reduce or expand the area and duration of the restrictions. The burden of providing information to support this determination will be borne by the lessee.

**Waiver:** The stipulation may be waived if, after consulting with the BLM Wildlife Biologist State Office Program Lead, the New Mexico Department of Game and Fish, and the U.S. Fish and Wildlife Service, it is determined that the described lands are incapable of serving as habitat for special status species and that these areas no longer warrant consideration as special status species habitat.

2560 Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day  
2561 public review.

2562 1.2.1.2 CSU—Rare Plant Resource Values (alternatives vary by application)

2563 Portions of the lease area contain rare plant species that require special protection to prevent  
2564 further degradation or damage and to promote population viability. These protections may  
2565 include, but are not limited to, conducting surveys for plant species prior to commencement of  
2566 any surface disturbing activities; fencing or netting to protect plant populations; and timing  
2567 restrictions.

2568 **Objective:** To protect rare plant species population viability in areas managed for this resource  
2569 value (including, but not limited to, ACECs managed for rare plant values), and to comply with  
2570 the Endangered Species Act and BLM policy as they pertain to rare plant species.

2571 **Exception:** An exception to this condition may be granted by the authorized officer if the  
2572 operator submits a plan which demonstrates that impacts from the proposed action can be  
2573 adequately mitigated.

2574 **Modification:** The boundaries of the affected area may be modified if the authorized officer  
2575 determines that a portion of the lease area no longer contains rare plants. The burden of  
2576 providing information to support this determination will be borne by the lessee. The boundaries  
2577 of the affected area may also be expanded if the authorized officer determines that such measures  
2578 are necessary to provide adequate protection for rare plant resources.

2579 **Waiver:** The boundaries of the affected area may be modified if the authorized officer  
2580 determines that the lease area no longer contains rare plant species. The burden of providing  
2581 information to support this determination will be borne by the lessee. The boundaries of the  
2582 affected area may also be expanded if the authorized officer determines that such measures are  
2583 necessary to provide adequate protection for rare plant species.

2584 Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day  
2585 public review.

2586 1.2.1.3 NSO—Rare Plant Resource Values (alternatives vary by application)

2587 No surface occupancy will be allowed within the lease area in order to protect rare plant species

2588 **Objective:** To protect rare plant species population viability in areas managed for this resource  
2589 value (including, but not limited to, ACECs managed for rare plant values), and to comply with  
2590 the Endangered Species Act and BLM policy as they pertain to rare plant species.

2591 **Exception:** An exception to this condition may be granted by the authorized officer if the  
2592 operator submits a plan which demonstrates that impacts from the proposed action can be  
2593 adequately mitigated.

2594 **Modification:** The boundaries of the affected area may be modified if the authorized officer  
2595 determines that a portion of the lease area no longer contains rare plants. The burden of  
2596 providing information to support this determination will be borne by the lessee. The boundaries

of the affected area may also be expanded if the authorized officer determines that such measures are necessary to provide adequate protection for rare plant resources.

**Waiver:** The boundaries of the affected area may be modified if the authorized officer determines that the lease area no longer contains rare plant species. The burden of providing information to support this determination will be borne by the lessee. The boundaries of the affected area may also be expanded if the authorized officer determines that such measures are necessary to provide adequate protection for rare plant species.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

#### 1.2.1.4 TLS—Raptor Nests

Prior to survey/flagging locations for pads, routes for roads, and any other preliminary activity, the project area will be surveyed for raptor nests. Surveys will be conducted by professional biologists approved by the Authorized Officer. All raptor nests and bald eagle wintering areas will be avoided within a distance and time frame appropriate for the species, as specified by the Authorized Officer. These distances range from 0.25 mile to 1.0 mile and the time restrictions range from January 1 to July 31.

Long-term surface use activities will not be allowed within the species-specific spatial buffer zone of active nests. Short-term activities will be avoided within the species-specific spatial buffer zones during the corresponding time restriction. All other raptor species nests will be avoided by the spatial buffer zone specified by the Authorized Officer, regardless of the duration of the activity.

A short-term activity is defined as an activity which would begin outside of a given breeding season and end prior to initiation of a given breeding season. A long-term activity is defined as an activity which would continue into or beyond a given nesting/breeding season. An active nest is defined as any nest that has been occupied in the last seven years. A nest will be determined active or inactive by the Authorized Officer.

**Objective:** To protect raptor nesting activity, and to comply with the Migratory Bird Treaty Act.

**Exception:** An exception to this condition may be granted by the authorized officer if the lessee submits a plan which demonstrates that the impacts from the proposed action can be adequately mitigated. The exception may apply to either the boundary of the affected area or the duration of the restriction if an environmental analysis determines that the buffer area required for a raptor nest is smaller or larger than the buffer radius specified in the original stipulation, or if the raptor nesting period is different than the period specified in the original stipulation. The burden of providing information to support this determination will be borne by the lessee.

**Modification:** The authorized officer may modify the area subject to the stipulation, or the duration of the stipulation, if an environmental analysis finds that a portion of the TLS area is nonessential, or that the proposed action could be conditioned so as not to impair the function or utility of the area for current or subsequent use by nesting raptors. This modification could either

2635 reduce or expand the area and duration of the restrictions. The burden of providing information  
2636 to support this determination will be borne by the lessee.

2637 **Waiver:** The stipulation may be waived if, after consulting with the New Mexico Department of  
2638 Game and Fish and the BLM Wildlife Biologist State Office Program Lead, it is determined that  
2639 the described lands are incapable of serving as raptor nesting areas and that these areas no longer  
2640 warrant consideration as raptor nesting habitat.

2641 Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day  
2642 public review.

2643 1.2.1.5 CSU—Prairie Dog Towns

2644 Surface-disturbing and disruptive activities may be controlled or excluded (Alt. B: 0.5 mi. from;  
2645 Alt. C: 0.25 mi. from; Alt. D: within) prairie dog towns, if an activity would adversely impact  
2646 prairie dogs and/or associated species.

2647 **Objective:** To protect prairie dog colonies and habitat for associated species.

2648 **Exception:** An exception to this condition may be granted by the authorized officer if the lessee  
2649 submits a plan which demonstrates that the impacts from the proposed action can be adequately  
2650 mitigated. The exception may apply to the boundary of the affected area if an environmental  
2651 analysis determines that the area required to protect a prairie dog colony is smaller or larger than  
2652 the area specified in the original stipulation. The burden of providing information to support this  
2653 determination will be borne by the lessee.

2654 **Modification:** The boundaries of the affected area may be modified if the authorized officer  
2655 determines that portions of the area can be occupied without adversely affecting prairie dogs.  
2656 The burden of providing information to support this determination will be borne by the lessee.  
2657 The boundaries of the affected area may also be expanded if the authorized officer determines  
2658 that such measures are necessary to provide adequate protection for prairie dog populations.

2659 **Waiver:** This stipulation may be waived if, after consulting with the New Mexico Department of  
2660 Game and Fish and the BLM Wildlife Biologist State Office Program Lead, it is determined that  
2661 the described lands are no longer occupied by prairie dogs and thus do not warrant consideration  
2662 for protection.

2663 Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day  
2664 public review.

2665 1.2.1.6 TLS—Big Game Winter Range

2666 Surface-disturbing and disruptive activities are prohibited from November 15 to April 30 within  
2667 winter range for mule deer, elk and antelope. Travel on identified designated roads may include  
2668 these timing restrictions or limited site visits.

2669 **Objective:** To protect mule deer, elk, and antelope winter range from disturbance during the  
2670 winter use season, and to facilitate long-term maintenance of wildlife populations.

**Exception:** An exception to this condition may be granted by the authorized officer if the lessee submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated. The exception may apply to either the boundary of the affected area or the duration of the restriction if an environmental analysis determines that the area required for big game winter range is smaller or larger than the area specified in the original stipulation, or if the time period when the range is occupied by big game is different than the period specified in the original stipulation. The burden of providing information to support this determination will be borne by the lessee.

**Modification:** The boundaries of the affected area may be modified if the authorized officer determines that the area utilized as winter range by big game species has shifted. The dates for the timing restriction may be modified if new wildlife use information indicates that the November 15 to April 30 dates are not valid for the area. The burden of providing information to support this determination will be borne by the lessee.

**Waiver:** This stipulation may be waived if, after consulting with the New Mexico Department of Game and Fish and the BLM Wildlife Biologist State Office Program Lead, it is determined that the described lands are no longer occupied by big game species and thus do not warrant consideration for protection.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

#### 1.2.1.7 TLS—Big Game Fawning/Calving Range (Alts. B, C)

Surface-disturbing and disruptive activities are prohibited at the times specified below within fawning/calving habitat for mule deer, elk, and antelope. Travel on identified designated roads may include these timing restrictions or limited site visits.

- Mule Deer: May 1 to August 31
- Elk: May 1 to June 30
- Antelope: May 1 to July 15

**Objective:** To protect mule deer, elk, and antelope fawning/calving habitat from disturbance, and to facilitate long-term maintenance of wildlife populations.

**Exception:** An exception to this condition may be granted by the authorized officer if the lessee submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated. The exception may apply to either the boundary of the affected area or the duration of the restriction if an environmental analysis determines that the area required for big game fawning/calving range is smaller, larger, or shifted relative to the area specified in the original stipulation, or if the time period when the range is occupied by fawning/calving big game is different than the period specified in the original stipulation. The burden of providing information to support this determination will be borne by the lessee.

**Modification:** The boundaries of the affected area may be modified if the authorized officer determines that the area utilized by fawning/calving big game species has shifted. The dates for

the timing restriction may be modified if new wildlife use information indicates that the specified dates are not valid for the area. The burden of providing information to support this determination will be borne by the lessee.

**Waiver:** This stipulation may be waived if, after consulting with the New Mexico Department of Game and Fish and the BLM Wildlife Biologist State Office Program Lead, it is determined that the described lands are no longer occupied by fawning/calving big game species and thus do not warrant consideration for protection.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

#### 1.2.1.8 CSU—Wildlife Habitat Projects

Surface-disturbing or long-term noise producing activities which exceed a noise level of 75dbA, measured at the perimeter of the 200-meter protective spatial buffer, will not be allowed within 200 meters of existing or planned wildlife habitat improvement projects. If the 75dbA noise level is determined to not provide adequate protection from the auditory impact created by lease operations, a stricter level shall be applied as a condition of approval for lease operations. A more restrictive spatial buffer may be applied where the 200-meter spatial buffer has been documented to not provide adequate protection. Use and occupancy within the 200-meter spatial buffer will be authorized only when lessee/ operator demonstrates that the area is essential for operations and when the lessee/operator submits a satisfactory surface use and operations plan, which adequately protects resources of concern.

**Objective:** Protection of wildlife habitat enhancement projects for purposes of preventing further habitat fragmentation and loss of use of otherwise suitable/effective habitat.

**Exception:** An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.

**Modification:** The boundaries of the affected area may be modified if the authorized officer determines that portions of the area no longer contain wildlife habitat project areas. The boundaries of the affected area may also be expanded if the authorized officer determines that such measures are necessary to provide adequate protection for wildlife enhancement projects.

**Waiver:** This condition may be waived if the authorized officer determines that the affected area no longer contains wildlife habitat project areas. The boundaries of the affected area may also be expanded if the authorized officer determines that such measures are necessary to provide adequate protection for wildlife enhancement projects.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

#### 1.2.1.9 CSU—Wildlife Resource Values

All or portions of the lease area contain special wildlife habitat features that require special protection to prevent further degradation or damage. These protections may include, but are not



limited to, conducting surveys for plant, animal, or other species prior to commencement of any surface disturbing activities; the inclusion of noise abatement structures, additional fencing or netting; and timing restrictions.

Applications for surface-disturbing or long-term noise producing activities, which exceed a noise level of 75dbA at the edge of the well pad, will be authorized only when lessee/operator demonstrates that the area is essential for operations and when the lessee/operator submits a satisfactory surface use and operations plan that provides protection for these special resource values. If the 75dbA noise level is determined to not provide adequate protection from the auditory impact created by lease operations, a stricter level shall be applied as a condition of approval for lease operations. The BLM Authorized Officer will work with the lease holder on a case-by-case basis to achieve an acceptable level of noise mitigation.

**Objective:** To protect wildlife habitat and maintain wildlife population viability in areas managed for this resource value (including, but not limited to, ACECs managed for this value).

**Exception:** An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated.

**Modification:** The boundaries of the affected area may be modified if the authorized officer determines that portions of the lease area no longer contain wildlife resource values. The burden of providing information to support this determination will be borne by the lessee. The boundaries of the affected area may also be expanded if the authorized officer determines that such measures are necessary to provide adequate protection for wildlife resource values.

**Waiver:** The boundaries of the affected area may be modified if the authorized officer determines that the lease area no longer contains wildlife resource values. The burden of providing information to support this determination will be borne by the lessee. The boundaries of the affected area may also be expanded if the authorized officer determines that such measures are necessary to provide adequate protection for wildlife resource values.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

#### 1.2.1.10 NSO—Wildlife Resource Values

Within areas managed for wildlife resource values, surface-disturbing activities will be prohibited.

**Objective:** To protect wildlife habitat and maintain wildlife population viability in areas managed for this resource value (including, but not limited to, ACECs managed for this value).

**Exception:** An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated.

**Modification:** The boundaries of the affected area may be modified if the authorized officer determines that portions of the lease area no longer contain wildlife resource values. The burden

of providing information to support this determination will be borne by the lessee. The boundaries of the affected area may also be expanded if the authorized officer determines that such measures are necessary to provide adequate protection for wildlife resource values.

**Waiver:** The boundaries of the affected area may be modified if the authorized officer determines that the lease area no longer contains wildlife resource values. The burden of providing information to support this determination will be borne by the lessee. The boundaries of the affected area may also be expanded if the authorized officer determines that such measures are necessary to provide adequate protection for wildlife resource values.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

### 1.2.2 Riparian Area Stipulations

#### 1.2.2.1 NSO—Streams, riparian & wetland areas, & 100-year floodplains

Surface-disturbing activities are prohibited within 100-year floodplains or within 0.25 mi. of the channels of ephemeral, intermittent, and perennial streams, or within 0.25 mi. of the outer margins of riparian and wetland areas.

**Objective:** To protect the unique biological and hydrological features associated with streams, riparian/wetland areas, and 100-year floodplains.

**Exception:** An exception to this condition may be granted by the authorized officer if the operator submits a plan which demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated. Mitigation may include a bunker or dual-walled drum to prevent/contain any potential spill. An exception may also be allowed when the surface of the site is 20 feet higher than the channel (out of the floodplain). The boundary of the affected area may also be expanded if the authorized officer determines that a larger area than is specified in the original lease stipulation requires no surface occupancy in order to protect streams, riparian areas, wetland areas, and the 100-year floodplain from the impacts of development.

**Modification:** The area affected by this condition may be modified by the authorized officer if it is determined that portions of the area do not include riparian/wetland areas. The burden of providing information to support this determination will be borne by the lessee. The boundary of the affected area may also be expanded if the authorized officer determines that a larger area than is specified in the original lease stipulation requires no surface occupancy in order to protect streams, riparian areas, wetland areas, and the 100-year floodplain from the impacts of development.

**Waiver:** This condition may be waived by the authorized officer if it is determined that the affected area does not include streams or riparian/wetland areas. The burden of providing information to support this determination will be borne by the lessee. The boundary of the affected area may also be expanded if the authorized officer determines that a larger area than is specified in the original lease stipulation requires no surface occupancy in order to protect

2822 streams, riparian areas, wetland areas, and the 100-year floodplain from the impacts of  
2823 development.

2824 Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day  
2825 public review.

2826 1.2.2.2 CSU—Streams, riparian & wetland areas, & 100-year floodplains (Alt. C)

2827 Surface-disturbing activities should be avoided within 100-year floodplains or within 0.25 mi. of  
2828 the channels of ephemeral, intermittent, and perennial streams, or within 0.25 mi. of the outer  
2829 margins of riparian and wetland areas.

2830 Long-term noise-producing activities which exceed a noise level of 75 A-weighted decibels  
2831 (75dbA), measured at the perimeter of a 400-meter protective spatial buffer, will not be allowed  
2832 within 400 meters of riparian areas (springs, seeps, tanks, rivers, streams, playas, canyon  
2833 bottoms, and floodplains). If the 75dbA noise level is determined to not provide adequate  
2834 protection from the auditory impact created by lease operations, a stricter level shall be applied  
2835 prior to authorizing lease operations. The BLM Authorized Officer will work with lease holder  
2836 on a case-by-case basis to achieve an acceptable level of noise mitigation. A more restrictive  
2837 spatial buffer may be applied where the 400-meter spatial buffer has been documented to not  
2838 provide adequate protection.

2839 **Objective:** To protect the unique biological and hydrological features associated with streams,  
2840 riparian/wetland areas, and 100-year floodplains, and the protection of riparian habitat for  
2841 purposes of preventing further habitat fragmentation and loss of use of otherwise  
2842 suitable/effective habitat.

2843 **Exception:** An exception to this condition may be granted by the authorized officer if the  
2844 operator submits a plan which demonstrates that impacts from the proposed action on soil, water,  
2845 and wildlife resources can be adequately mitigated. Mitigation may include a bunker or dual-  
2846 walled drum to prevent/contain any potential spill, noise abatement, or other measures. An  
2847 exception may also be allowed when the surface of the site is 20 feet higher than the channel (out  
2848 of the floodplain). The boundary of the affected area may also be expanded if the authorized  
2849 officer determines that a larger area than is specified in the original lease stipulation requires no  
2850 surface occupancy in order to protect streams, riparian areas, wetland areas, and the 100-year  
2851 floodplain from the impacts of development.

2852 **Modification:** The area affected by this condition may be modified by the authorized officer if it  
2853 is determined that portions of the area do not include riparian/wetland areas. The burden of  
2854 providing information to support this determination will be borne by the lessee. The boundary of  
2855 the affected area may also be expanded if the authorized officer determines that a larger area than  
2856 is specified in the original lease stipulation requires no surface occupancy in order to protect  
2857 streams, riparian areas, wetland areas, and the 100-year floodplain from the impacts of  
2858 development.

2859 **Waiver:** This condition may be waived by the authorized officer if it is determined that the  
2860 affected area does not include streams or riparian/wetland areas. The burden of providing

information to support this determination will be borne by the lessee. The boundary of the affected area may also be expanded if the authorized officer determines that a larger area than is specified in the original lease stipulation requires no surface occupancy in order to protect streams, riparian areas, wetland areas, and the 100-year floodplain from the impacts of development.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

#### 1.2.2.3 CSU—Biological Soil Crusts

Surface-disturbing activities will be subject to limitations beyond those provided for in standard terms and conditions in areas managed for biological soil crust resources. These limitations may include, but are not limited to, restricting vehicle traffic to existing roads wherever possible, minimizing the size of well pad construction, and ceasing work when soils are wet. Any additional surveys, mitigation measures, or monitoring activities required as a result of surface-disturbing activities in these areas will be at the cost of the lessee.

**Objective:** The protection of biological soil crust structural integrity and diversity.

**Exception:** An exception may be granted if the lessee submits a plan demonstrating that the proposed action can occur without impacting biological soil crusts.

**Modification:** The boundary of the area affected by this stipulation may be modified if the authorized officer determines that there are no biological soil crusts within portions of the lease area. The burden of providing information to support this determination will be borne by the lessee. The boundary of the area affected may also be expanded if the authorized officer determines that such an action is required to protect biological soil resources.

**Waiver:** The boundary of the area affected by this stipulation may be modified if the authorized officer determines that there are no biological soil crusts within the lease area. The burden of providing information to support this determination will be borne by the lessee. The boundary of the area affected may also be expanded if the authorized officer determines that such an action is required to protect biological soil resources.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

#### 1.2.2.4 NSO—Biological Soil Crusts

Surface-disturbing activities will be prohibited in areas managed for biological soil crust resources.

**Objective:** The protection of biological soil crust structural integrity and diversity.

**Exception:** An exception may be granted if the lessee submits a plan demonstrating that the proposed action can occur without impacting biological soil crusts.

**Modification:** The boundary of the area affected by this stipulation may be modified if the authorized officer determines that there are no biological soil crusts within portions of the lease

area. The burden of providing information to support this determination will be borne by the lessee. The boundary of the area affected may also be expanded if the authorized officer determines that such an action is required to protect biological soil resources.

**Waiver:** The boundary of the area affected by this stipulation may be modified if the authorized officer determines that there are no biological soil crusts within the lease area. The burden of providing information to support this determination will be borne by the lessee. The boundary of the area affected may also be expanded if the authorized officer determines that such an action is required to protect biological soil resources.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

### 1.2.3 Cultural Resource Stipulations

#### 1.2.3.1 CSU—National Register of Historic Places

Surface-disturbing activities will be subject to limitations in areas near cultural resource sites that are eligible for, or are listed on, the National Register of Historic Places.

**Objective:** To protect cultural resource sites that are eligible for, or listed on, the National Register of Historic Places.

**Exception:** An exception to this stipulation may be granted if the lessee submits a plan demonstrating that impacts from the proposed action can be adequately mitigated. The authorized officer may require the lessee to fund a cultural resources inventory to make this determination.

**Modification:** A modification may be granted if the authorized officer determines that portions of the lease area contain no NRHP-eligible or NRHP-listed sites. The authorized officer may require the lessee to fund a cultural resources inventory to make this determination.

**Waiver:** A modification may be granted if the authorized officer determines that the lease area contains no NRHP-eligible or NRHP-listed sites. The authorized officer may require the lessee to fund a cultural resources inventory to make this determination.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

#### 1.2.3.2 CSU—Cultural Resource Values

Surface disturbing activities will be subject to restrictions beyond standard lease terms and conditions within areas managed for cultural resource values. Access to the leases in these areas will be limited to routes designated in the approved permit for lease operations. Applications for surface disturbing aspects of lease development will be evaluated for potential proximity to sensitive nationally significant cultural resources (known and suspected) and could require expanded pre-field records search, subsurface testing and/or metal detector survey in addition to routine cultural resource surface inventory for compliance with Section 106 of the NHPA, the costs of which will be borne by the lessee. This could result in extended time frames for

2935 processing authorizations for development activities. All proposed surface-disturbing aspects of  
2936 lease development will be located to avoid and/or protect the cultural resources present.

2937 **Objective:** Protection of highly significant and sensitive historic and prehistoric resources that  
2938 might not be detected by means of standard Class III cultural resource inventory from direct and  
2939 indirect effects of lease development.

2940 **Exception:** Requests for exception would be based on a case-by-case basis sensitivity evaluation  
2941 and on available information regarding site-specific soil stability, site probability and any  
2942 proposal for alternate forms of mitigation.

2943 **Modification:** The boundaries of the affected areas may be modified if the authorized officer  
2944 determines that there are no significant cultural resources present in portions of the lease. The  
2945 burden of providing information to support this determination will be borne by the lessee.

2946 Waiver: None

2947 Exception or modification of this stipulation will require a NEPA analysis and 30-day public  
2948 review.

2949 NSO—Cultural Resource Values (application varies by area)

2950 Surface disturbing activities will be prohibited within areas managed for cultural resource values.

2951 **Objective:** Protection of highly significant and sensitive historic and prehistoric resources that  
2952 might not be detected by means of standard Class III cultural resource inventory from direct and  
2953 indirect effects of lease development.

2954 **Exception:** None.

2955 **Modification:** The boundaries of the affected areas may be modified if the authorized officer  
2956 determines that there are no significant cultural resources present in portions of the lease. The  
2957 burden of providing information to support this determination will be borne by the lessee.

2958 **Waiver:** The boundaries of the affected areas may be modified if the authorized officer  
2959 determines that there are no significant cultural resources present in the lease. The burden of  
2960 providing information to support this determination will be borne by the lessee.

2961 Modification or waiver of this stipulation will require a NEPA analysis and 30-day public  
2962 review.

#### 2963 1.2.4 Geological Resource Stipulations

##### 2964 1.2.4.1 NSO—Cave & Karst

2965 All or portions of the lease are located in a potential cave or karst occurrence area. Surface  
2966 occupancy is prohibited within 200 meters of known cave entrances, passages or aspects of  
2967 significant caves, or significant karst features. Within this area, cave or karst features such as  
2968 sinkholes, passages, and large rooms may be encountered from the surface to a depth of as much  
2969 as 2,000 feet, within areas ranging from a few acres to hundreds of acres.

2970 **Objective:** To protect the structural integrity of cave and karst geologic structures and the  
2971 biological diversity therein from the impacts of oil and gas development.

2972 **Exception:** An exception may be granted if the lessee submits a plan demonstrating that impacts  
2973 from the proposed action are acceptable or can be adequately mitigated.

2974 **Modification:** A modification may be granted if the authorized officer determines that there are  
2975 no cave or karst features within portions of the lease area. The authorized officer may require the  
2976 lessee to fund a survey to make this determination.

2977 **Waiver:** A modification may be granted if the authorized officer determines that there are no  
2978 cave or karst features within the lease area. The authorized officer may require the lessee to fund  
2979 a survey to make this determination.

2980 Exception, modification, or waiver of this stipulation will require a NEPA analysis and 15-day  
2981 public review.

2982 1.2.4.2 CSU—Cave & Karst

2983 All or portions of the lease are located in a potential cave or karst occurrence area. Surface  
2984 occupancy will be strictly controlled within 200 meters of known cave entrances, passages or  
2985 aspects of significant caves, or significant karst features. Within this area, cave or karst features  
2986 such as sinkholes, passages, and large rooms may be encountered from the surface to a depth of  
2987 as much as 2,000 feet, within areas ranging from a few acres to hundreds of acres. Due to the  
2988 sensitive nature of the cave or karst systems, special protective measures may be developed  
2989 during environmental analyses and be required as part of approvals for drilling or other  
2990 operations on this lease. These measures could include changes in drilling operations, special  
2991 casing and cementing programs, modifications in surface activities, or other reasonable measures  
2992 to mitigate impacts to cave or karst values.

2993 **Objective:** To protect the structural integrity of cave and karst geologic structures and the  
2994 biological diversity therein from the impacts of oil and gas development.

2995 **Exception:** An exception may be granted if the lessee submits a plan demonstrating that impacts  
2996 from the proposed action are acceptable or can be adequately mitigated.

2997 **Modification:** A modification may be granted if the authorized officer determines that there are  
2998 no cave or karst features within portions of the lease area. The authorized officer may require the  
2999 lessee to fund a survey to make this determination.

3000 **Waiver:** A modification may be granted if the authorized officer determines that there are no  
3001 cave or karst features within the lease area. The authorized officer may require the lessee to fund  
3002 a survey to make this determination.

3003 Exception, modification, or waiver of this stipulation will require a NEPA analysis and 15-day  
3004 public review.

3005 1.2.4.3 CSU—Geologic Resource Values (application varies by area)

In areas managed for special geologic resource values, surface-disturbing activities may be restricted beyond what is required in standard terms and conditions. These restrictions may include, but are not limited to, designing developments in such a way that special geologic features are not impacted directly or indirectly.

**Objective:** The protection of special geologic resource values in areas managed for this value (includes, but is not limited to, ACECs managed for this value).

**Exception:** An exception to this condition may be granted if the lessee submits a plan demonstrating that the proposed action will not adversely impact geologic resource values, or that any impacts can be adequately mitigated.

**Modification:** A modification of this condition may be granted if the authorized officer determines that there are not geologic resource values within portions of the lease area. The burden of providing information to support this determination will be borne by the lessee. The boundaries affected by this condition may also be expanded if the authorized officer determines that such a measure is necessary to provide adequate protection of geologic resource values.

**Waiver:** A waiver of this condition may be granted if the authorized officer determines that there are not geologic resource values within the lease area. The burden of providing information to support this determination will be borne by the lessee. The boundaries affected by this condition may also be expanded if the authorized officer determines that such a measure is necessary to provide adequate protection of geologic resource values.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 15-day public review.

#### 1.2.4.4 NSO—Geologic Resource Values

In areas managed for special geologic resource values, surface-disturbing activities will be prohibited.

**Objective:** The protection of special geologic resource values in areas managed for this value (includes, but is not limited to, ACECs managed for this value).

**Exception:** An exception to this condition may be granted if the lessee submits a plan demonstrating that the proposed action will not adversely impact geologic resource values, or that any impacts can be adequately mitigated.

**Modification:** A modification of this condition may be granted if the authorized officer determines that there are not geologic resource values within portions of the lease area. The burden of providing information to support this determination will be borne by the lessee. The boundaries affected by this condition may also be expanded if the authorized officer determines that such a measure is necessary to provide adequate protection of geologic resource values.

**Waiver:** A waiver of this condition may be granted if the authorized officer determines that there are not geologic resource values within the lease area. The burden of providing information to support this determination will be borne by the lessee. The boundaries affected by this



condition may also be expanded if the authorized officer determines that such a measure is necessary to provide adequate protection of geologic resource values.

Exception, modification, or waiver of this condition will require analysis according to NEPA and a 15-day public review.

#### 1.2.5 Paleontological Stipulations

##### 1.2.5.1 CSU—Paleontological Resources, PFYC Class IV and V Areas

In areas of paleontological sensitivity (Potential Fossil Yield Classification [PFYC] Classes IV and V), a determination will be made by the BLM as to whether a survey by a qualified paleontologist (Qualification identified in BLM Handbook 8270) is necessary prior to the disturbance. In some cases, construction monitoring, project relocation, data recovery, or other mitigation will be required to ensure that significant paleontological resources are avoided or recovered during construction. Any significant fossils or localities previously known or discovered during the survey will be avoided by the permitted activity, or fully mitigated prior to allowing the activity to proceed. Surface occupancy or use is subject to the following special operating constraints:

- Restrict vehicles to existing roads and trails.
- Require a paleontological clearance on surface disturbing activities.

**Objective:** To protect paleontological resources from the impacts of oil and gas development.

**Exception:** An exception may be granted if the lessee submits a plan demonstrating that impacts from the proposed action are acceptable or can be adequately mitigated.

**Modification:** A modification may be granted if the authorized officer determines that no sensitive paleontological resources would be impacted by proposed activities in portions of the lease area. The burden of providing information to support this determination will be borne by the lessee.

**Waiver:** A waiver may be granted if the authorized officer determines that no sensitive paleontological resources are located in the lease area. The burden of providing information to support this determination will be borne by the lessee.

Exception, modification, or waiver of this stipulation will require a NEPA analysis and 30-day public review.

##### 1.2.5.2 CSU—Paleontological Resource Values

Within areas managed for paleontological resource values, a pedestrian survey must be conducted for paleontological material, using a qualified paleontologist, prior to any surface disturbing activity (qualification identified in BLM Handbook 8270). The survey will be used to determine appropriate level of mitigation during construction activities and production stages of the lease. A report on the results of the paleontological survey must be submitted to BLM as part of the permit application for the proposed lease activity.

3079 **Objective:** Protection of paleontological resource values in areas managed for these values  
3080 (including, but not limited to, ACECs).

3081 **Exception:** An exception may be granted if the lessee submits a plan demonstrating that impacts  
3082 from the proposed action are acceptable or can be adequately mitigated.

3083 **Modification:** A modification may be granted if the authorized officer determines that no  
3084 sensitive paleontological resources would be impacted by proposed activities in portions of the  
3085 lease area. The burden of providing information to support this determination will be borne by  
3086 the lessee.

3087 **Waiver:** A waiver may be granted if the authorized officer determines that no sensitive  
3088 paleontological resources are located in the lease area. The burden of providing information to  
3089 support this determination will be borne by the lessee.

3090 Exception, modification, or waiver of this condition will require analysis according to NEPA and  
3091 a 30-day public review.

3092 1.2.5.3 NSO—Paleontological Resource Values (application varies by area)

3093 Within areas managed for paleontological resource values where extraordinary paleontological  
3094 resources exist, no surface occupancy will be allowed.

3095 **Objective:** Protection of paleontological resource values in areas managed for these values  
3096 (including, but not limited to, ACECs).

3097 **Exception:** An exception may be granted if the lessee submits a plan demonstrating that impacts  
3098 from the proposed action are acceptable or can be adequately mitigated.

3099 **Modification:** A modification may be granted if the authorized officer determines that no  
3100 sensitive paleontological resources would be impacted by proposed activities in portions of the  
3101 lease area. The burden of providing information to support this determination will be borne by  
3102 the lessee.

3103 **Waiver:** A waiver may be granted if the authorized officer determines that no sensitive  
3104 paleontological resources are located in the lease area. The burden of providing information to  
3105 support this determination will be borne by the lessee.

3106 Exception, modification, or waiver of this condition will require analysis according to NEPA and  
3107 a 30-day public review.

3108 1.2.6 Recreation Stipulations

3109 1.2.6.1 NSO—Developed Recreation Areas

3110 Surface-disturbing activities are prohibited within 0.25 mile of designated recreation areas.

3111 **Objective:** To protect developed recreation areas and undeveloped recreation areas receiving  
3112 concentrated public use.

3113 **Exception:** An exception to this condition may be granted by the authorized officer if the  
3114 operator submits a plan demonstrating that impacts from the proposed action are acceptable or  
3115 can be adequately mitigated.

3116 **Modification:** The boundaries of the affected area may be modified by the authorized officer if  
3117 the recreation area boundaries are changed.

3118 **Waiver:** This condition may be waived if the authorized officer determines that the affected area  
3119 no longer contains developed recreation areas.

3120 Exception, modification, or waiver of this condition will require analysis according to NEPA and  
3121 a 30-day public review.

3122 1.2.7 Socioeconomic Stipulations

3123 1.2.7.1 NSO—Aviation facilities

3124 No occupancy or other activity on the surface of areas within 0.25 mi. of an airport or aviation  
3125 facility.

3126 **Objective:** To preserve the safety of aviation activities in and near airports. This includes, but is  
3127 not limited to, the following airports: Cuba Airport and Double Eagle Airport.

3128 Exception: None.

3129 **Modification:** The boundaries of the affected area may be modified by the authorized officer if  
3130 the airport boundaries are changed.

3131 **Waiver:** This condition may be waived if the authorized officer determines that the affected area  
3132 no longer contains an airport.

3133 Modification or waiver of this stipulation will require a NEPA analysis and 15-day public  
3134 review.

3135 1.2.7.2 NSO—Churches and cemeteries

3136 No surface occupancy will be allowed near churches or cemeteries. The lessee may be required  
3137 to conduct surveys to verify the presence of churches and/or cemeteries.

3138 **Objective:** To preserve the cultural, historical, and personal values contained within such areas.

3139 Exception: None.

3140 **Modification:** A modification may be granted if the authorized officer determines that there are  
3141 no churches or cemeteries within portions of the lease area. The burden of providing information  
3142 to support this determination will be borne by the lessee.

3143 **Waiver:** A waiver may be granted if the authorized officer determines that there are no churches  
3144 or cemeteries within the lease area. The burden of providing information to support this  
3145 determination will be borne by the lessee.

3146 Modification or waiver of this condition will require analysis according to NEPA and a 30-day  
3147 public review.

3148 1.2.7.3 CSU—Residential interface

3149 Areas of BLM mineral ownership intermingled with private lands may require screening,  
3150 buffering, noise abatement, or site relocation beyond that which is allowed under the standard  
3151 lease terms.

3152 **Objective:** To protect the private residences from being impacted by oil and gas development.  
3153 This stipulation gives the BLM the authority to relocate or modify the site more than it permitted  
3154 in the standard lease terms.

3155 **Exception:** An exception may be granted if the lessee provides a plan demonstrating that the  
3156 impacts of the proposed action will not impact private residences or the impacts are acceptable.

3157 **Modification:** A modification may be granted if the authorized officer determines that there are  
3158 no private residences within portions of the lease. The burden of providing information to  
3159 support this determination will be borne by the lessee.

3160 **Waiver:** A modification may be granted if the authorized officer determines that there are no  
3161 private residences within the lease. The burden of providing information to support this  
3162 determination will be borne by the lessee.

3163 Exception, modification, or waiver of this condition will require analysis according to NEPA and  
3164 a 30-day public review.

3165 1.2.7.4 LN—Split Estate

3166 APDs or project Plans of Development (PODs) on split-estate lands would not be approved  
3167 unless the operator a) certifies that a surface owner agreement has been reached or b) certifies in  
3168 a statement that an agreement could not be reached and that the operator would comply with the  
3169 provisions of the law or the regulations governing the federal or Indian right of re-entry to the  
3170 surface under 43 CFR 3814.

3171 **Objective:** To ensure proper surface owner notification by operators.

3172 **Exception:** None.

3173 **Modification:** None.

3174 **Waiver:** None.

3175 1.2.7.5 NSO—Health & Safety

3176 Within areas managed for the maintenance of public health and safety, no surface occupancy will  
3177 be allowed.

3178 **Objective:** To protect public health and safety within areas managed for this value. These areas  
3179 include, but are not limited to, the Legacy Uranium Mines ACEC.

3180 **Exception:** None.

3181 **Modification:** None.

3182 **Waiver:** None.

3183 1.2.8 Vegetation & Forestry Stipulations

3184 1.2.8.1 CSU—Lease Reclamation

3185 The subject properties contain wells, roads and/or facilities that were not plugged and/or  
3186 reclaimed to current standards. Unless the facilities (well pad and road) are put to a beneficial  
3187 and direct use under the new lease within two years of lease issuance, the lessee shall plug,  
3188 remediate and reclaim the facilities within two years of lease issuance. If an extension is  
3189 requested, the lessee must submit a detailed plan (including dates) prior to the two year deadline.  
3190 All plugging, remediation, and reclamation shall be performed in accordance with BLM  
3191 requirements and be approved in advance by the Authorized Officer. The well(s) to be plugged  
3192 and reclaimed are as follows: *{insert detailed location description}*. The facilities to be  
3193 reclaimed are as follows: *{insert detailed location description}*.

3194 **Objective:** Reduction of cumulative impacts of oil and gas development on public health &  
3195 safety, vegetation, soils, wildlife, visual resources, and livestock grazing.

3196 **Exception:** None.

3197 **Modification:** A modification may be granted if it is found that parts of the reclamation needs  
3198 identified have been resolved, or if the lessee can demonstrate that the cumulative impact of on  
3199 other resources is not significant.

3200 **Waiver:** A waiver may be granted if it is found that the reclamation needs identified have been  
3201 resolved, or if the lessee can demonstrate that the cumulative impact of the incomplete  
3202 reclamation on other resources is not significant.

3203 Modification or waiver of this condition will require analysis according to NEPA and a 30-day  
3204 public review.

3205 1.2.8.2 NSO—Ponderosa Pine

3206 The subject properties contain Ponderosa pine (*Pinus ponderosa*) trees. For the purpose of  
3207 preserving wildlife habitat, no surface occupancy for fluid mineral development will be allowed  
3208 within vegetation types that contain Ponderosa pine.

3209 **Objective:** The preservation of wildlife habitat and Ponderosa pine age class diversity.

3210 **Exception:** None.

3211 **Modification:** A modification may be granted if the authorized officer determines that there are  
3212 no Ponderosa pine trees in portions of the lease area. The lessee may be required to demonstrate  
3213 the absence of Ponderosa pine trees by conducting a forest inventory.

3214 **Waiver:** A waiver may be granted if the authorized officer determines that there are no  
3215 Ponderosa pine trees in the lease area. The lessee may be required to demonstrate the absence of  
3216 Ponderosa pine trees by conducting a forest inventory.

3217 Modification or waiver of this condition will require analysis according to NEPA and a 30-day  
3218 public review.

3219 1.2.9 Minerals Stipulations

3220 1.2.9.1 CSU—Plan of Development

3221 A plan of development (POD) for the entire lease must be submitted for review and approval,  
3222 including NEPA analysis, by the BLM authorized officer, PRIOR to approval of development  
3223 (APD or Sundry Notice) actions. The POD must indicate planned access to well facilities (roads,  
3224 pipelines, power lines), and the approximate location of well sites. Should it become necessary to  
3225 amend the POD, the amendment must be approved prior the approval of subsequent development  
3226 action. Deviations from a current POD are not authorized until an amended POD has been  
3227 approved by BLM.

3228 **Objective:** To limit the cumulative effects of oil and gas development by planning the  
3229 development of oil and gas fields in such a manner that limits surface disturbance, and to  
3230 promote a more efficient NEPA process.

3231 **Exception:** A POD is not necessary if the lease is developed as part of a unitization agreement.

3232 **Modification:** A modification may be granted if the lessee submits a plan for future submission  
3233 of a POD (for instance, after the drilling of an initial test well).

3234 **Waiver:** None.

3235 Exception or modification of this condition will require analysis according to NEPA and a 30-  
3236 day public review.

3237 1.2.9.2 CSU—Orphan wells

3238 The subject parcel is known to contain an unplugged well. For the purpose of protection of  
3239 public health and safety, the lessee shall provide for proper plugging of the following abandoned  
3240 wells: {*provide specific location information here*}, unless the lessee will re-enter the well  
3241 within two years of lease issuance.

3242 **Objective:** To protect the health and safety of the human environment, wildlife, and subsurface  
3243 geologic features, and to reduce the cumulative impact of oil and gas development.

3244 Exception: None.

3245 **Modification:** A modification may be granted if the lessee demonstrates that the subject wells  
3246 are plugged to BLM standards.

3247 **Waiver:** A waiver may be granted if the authorized officer determines that there are no  
3248 unplugged wells within the lease.

3249 Modification or waiver of this condition will require analysis according to NEPA and a 30-day  
3250 public review.

3251 1.3 State Office Stipulations

This section describes the stipulations created by the BLM New Mexico State Office. Because these stipulations are created at the State Office, the RPFO cannot revise these in this RMP. However, these stipulations are available for our use to protect resources and resource uses as appropriate and are provided here for reference.

#### 1.3.1 LN—Coal Protection (NM-8-LN)

Federal coal resources exist on this lease. Operations authorized by this lease may be altered or modified by the authorized officer (at the address shown below) in order to conserve and protect the mineral resources and provide for simultaneous operations.

#### 1.3.2 LN—Drainage (NM-10-LN)

All or part of the lands contained in this lease are subject to drainage by well(s) located adjacent to this lease. The lessee shall be required within 6 months of lease issuance to submit to the AO plans for protecting the lease from drainage. Compensatory royalty will be assessed effective the expiration of this 6-month period if no plan is submitted. The plan must include either an Application for Permit to Drill (APD) a protective well, or an application to communitize the lease so that it is allocated production from a protective well off the lease. Either of these options may include obtaining a variance to State-spacing for the area. In lieu of this plan, the lessee shall be required to demonstrate that a protective well would have little or no chance of encountering oil and gas in quantities sufficient to pay in excess the costs of protecting the lease from drainage or an acceptable justification why a protective well would be uneconomical, the lessee shall be obligated to pay compensatory royalty to the Minerals Management Service at a rate to be determined by the AO.

#### 1.3.3 CSU—Highway Material Site Right-of-Way (NM-4-CSU)

The lessee/operator shall conduct operations in conformity with the following requirements:

1. The New Mexico State Highway Department will have unrestricted rights of ingress and egress to the right-of way.
2. The lessee/operator will not conflict with the right of the New Mexico State Highway Department to remove any road-building materials from the right-of-way.
3. The New Mexico State Highway Department reserves the right to set up, operate, and maintain such facilities as are reasonable to expedite the removal, production, and use of the materials; and the lessee shall not interfere with the Highway Department's use of the property for such purposes.
4. The lessee/operator will make no excavations and erect no structures on the right-of-way that might be adverse to the use and interest of the land by the New Mexico State Highway Department.

#### 1.3.4 NSO—Occupied Structures and Dwellings (NM-12-NSO)

Occupied Structures and Dwellings - All or a portion of the lease contains dwellings or structures occupied by one or more persons. No Surface Occupancy is allowed on the portion of the lease

described below. These restricted lands may be developed by directional drilling from outside the restricted area. For the Purpose of: Lessening the impacts caused by mineral resource development on a place of residence and the occupants within.

#### 1.3.5 NSO—Pooling Purposes Only (NM-9-NSO)

No surface occupancy or use is allowed on the lease. The purpose of this lease is solely for participation in a unit or for pooling purposes.

#### 1.3.6 LN—Cultural Resources (NM-11-LN)

All development activities proposed under the authority of this lease are subject to compliance with Section 106 of the NHPA and Executive Order 13007. The lease area may contain historic properties, traditional cultural properties (TCP's), and/or sacred sites currently unknown to the BLM that were not identified in the Resource Management Plan or during the lease parcel review process. Depending on the nature of the lease developments being proposed and the cultural resources potentially affected, compliance with Section 106 of the National Historic Preservation Act and Executive Order 13007 could require intensive cultural resource inventories, Native American consultation, and mitigation measures to avoid adverse effects—the costs for which will be borne by the lessee. The BLM may require modifications to or disapprove proposed activities that are likely to adversely affect TCP's or sacred sites for which no mitigation measures are possible. This could result in extended time frames for processing authorizations for development activities, as well as changes in the ways in which developments are implemented.

#### 1.3.7 NM-1-LN Potential, Suitable and Occupied Habitat For Special Status Plant Species

The lease contains potential, suitable and/or occupied habitat for special status plant species; therefore, special status plant species clearance surveys may be required prior to approving any surface disturbing activities within or adjacent to BLM Special Status Plant Species' potential, suitable and occupied habitats.

Survey requirements would include the following:

- Clearance surveys must be conducted by a qualified botanist as determined the BLM.
- The area to be surveyed will include at a minimum the project area plus an additional 100 meters outside the project area.
- Clearance surveys will be conducted during the blooming season or the period in which the plant species is most easily detected as determined by the BLM.

Based on the results of the survey, conditions of approval may be applied to land use authorizations and permits that fall within the area of direct/indirect impacts or affected habitat, as appropriate. Possible mitigation strategies may include, but are not limited to:

- Avoidance/restriction of development such as locating the surface disturbance area away



- from the edge of occupied or suitable habitat and ideally outside of the area where indirect/direct impacts would occur;
- Minimizing the area of disturbance utilizing strategies such as but not limited to twinning, and utilizing existing disturbance and corridors;
  - Dust abatement measures;
  - Signs, fencing, and other deterrents to reduce human disturbance;
  - Construction of well sites, roads and associated facilities outside of the blooming season;
  - Specialized reclamation procedures such as, but not limited to,
    - separating soil and subsoil layers with barriers to reclaim in the correct order,
    - using a higher percentage of forbs in the reclamation seed mix to promote pollinator habitat,
    - collection of seeds for sensitive plant species' genetic preservation, grow-out, and reclamation;
  - Long term monitoring of indirect/direct impacts on the species and/or habitat;
  - Qualified, independent third-party contractors to provide general oversight and assure compliance with project terms and conditions during construction;
  - Non-native or invasive species monitoring and control in occupied and suitable habitat;
  - Any other on-site habitat protection or improvements, known by best available science to be beneficial.

#### 1.4 Washington Office Stipulations

This section describes the stipulations created by the BLM Washington Office. Because these stipulations are created at the Washington Office, the RPFO cannot revise these in this RMP. However, these stipulations are available for our use to protect resources and resource uses as appropriate and are provided here for reference.

##### 1.4.1 Endangered Species Act – Section 7 Consultation (WO-ESA-7)

The lease area may now or hereafter contain plants, animals or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. § 1531 et seq., including completion of any required procedure for conference or consultation.

##### 1.4.2 Bureau of Reclamation – Section 7 Consultation (WO-BOR-7)

The lands encompassed by this lease are managed by the U. S. Bureau of Reclamation and contain riparian and aquatic habitat that may be suitable for special status species. No surface disturbing activities will be authorized on this lease unless and until a Biological Evaluation has been completed that meets requirements of the U. S. Fish and Wildlife Service. BLM may

3365 require modifications to or disapprove proposed activity that is likely to result in jeopardy to the  
3366 continued existence of a proposed or listed threatened or endangered species or result in the  
3367 destruction or adverse modification of a designated or proposed critical habitat.

#### 3368 1.4.3 Cultural Resources and Tribal Consultation Stipulation

3369 This lease may be found to contain historic properties and/or resources protected under the  
3370 National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native  
3371 American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and  
3372 executive orders. The BLM will not approve any ground-disturbing activities that may affect  
3373 any such properties or resources until it completes its obligations (e.g., State Historic  
3374 Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the  
3375 NHPA and other authorities. The BLM may require modification to exploration or development  
3376 proposals to protect such properties, or disapprove any activity that is likely to result in adverse  
3377 effects that cannot be successfully avoided, minimized, or mitigated.

3378

## **APPENDIX 5: Phases of Oil and Gas Development**

### **6.1 Construction Activities**

Clearing of the proposed well pad and access road would be limited to the smallest area possible to provide safe and efficient work areas for all phases of construction. First all new construction areas need to be cleared of all vegetation. All clearing activities are typically accomplished by cutting, mowing and/or grading vegetation as necessary. Cut vegetation may be mulched and spread on site or hauled to a commercial waste disposal facility.

Next, heavy equipment including but not limited to bulldozers, graders, front-end loaders, and/or track hoes are used to construct at a minimum the pad, but other features, as needed for development, may include, but is not limited to an access road, reserve pit, pipeline, and/or fracturing pond. Cut and fills may be required to level the pad or road surfaces. If a reserve pit is authorized, it would be lined using an impermeable liner or other lining mechanism (i.e. bentonite or clay) to prevent fluids from leeching into the soil. Access roads may have cattle guards, gates, drainage control, or pull-outs installed, among a host of other features that may be necessary based on the site specific situation. Long-term surfaces are typically dressed with a layer of crushed rock or soil cemented. Construction materials come from a variety of sources. Areas not needed for long-term development (i.e. portions of the pipeline or road right-of-way) are reclaimed by recontouring the surface and establishing vegetation.

If a pipeline is needed, the right-of-way would be cleared of all vegetation. The pipeline would be laid out within the cleared section. A backhoe, or similar piece of equipment, would dig a trench at least 36 inches below the surface. After the trench is dug, the pipes would be assembled by welding pieces of pipe together and bending them slightly, if necessary, to fit the contour of the pipeline's path. Once inspected, the pipe can be lowered into the trench and covered with stockpiled subsoil that was originally removed from the hole. Each pipeline undergoes hydrostatic testing prior to natural gas being pumped through the pipeline. This ensures the pipeline is strong enough and absent of any leaks.

### **6.2 Drilling Operations**

When the pad is complete, the drilling rig and associated equipment would be moved onsite and erected. A conventional rotary drill rig with capability matched to the depth requirements of the proposed well(s) would be used. The well could be drilled as a vertical or horizontal well to target the desired formation. The depth of the well is entirely dependent on the target formation depth and could be several hundred feet vertical depth to over 20,000 feet vertical depth.

When a conventional reserve pit system is proposed, drilling fluid or mud is circulated through the drill pipe to the bottom of the hole, through the bit, up the bore of the well, and finally to the surface. When mud emerges from the hole, it enters into the reserve pit where it would remain until all fluids are evaporated and the solids can be buried.

A closed-loop system, operates in a similar fashion except that when the mud emerges from the hole, it passes through a series of equipment used to screen and remove drill cuttings (rock chips) and sand-sized solids rather than going into the pit. When the solids have been removed, the mud would be placed into holding tanks, and from the tank, used again.

In either situation the mud is maintained at a specific weight and viscosity to cool the bit, seal off any porous zones (thereby protecting aquifers or preventing damage to producing zone productivity), control subsurface pressure, lubricate the drill string, clean the bottom of the hole, and bring the drill cuttings to the surface. Water-based or oil-based muds can be used and is entirely dependent on the site-specific conditions.

### 6.3 Completion Operations

Once a well has been drilled, completion operations would begin once crews and equipment are available. Well completion involves setting casing to depth and perforating the casing in target zones.

Wells are often treated during completion to improve the recovery of hydrocarbons by increasing the rate and volume of hydrocarbons moving from the natural oil and gas reservoir into the wellbore. These processes are known as well-stimulation treatments, which create new fluid passageways in the producing formation or remove blockages within existing passageways. They include fracturing, acidizing, and other mechanical and chemical treatments often used in combination. The results from different treatments are additive and complement each other.

### 6.4 Hydraulic Fracturing

Hydraulic fracturing (HF) is one technological key to economic recovery of oil and gas that might have been left by conventional oil and gas drilling and pumping technology. It is a formation stimulation practice used to create additional permeability in a producing formation, thus allowing gas to flow more readily toward the wellbore. Hydraulic fracturing can be used to overcome natural barriers, such as naturally low permeability or reduced permeability resulting from near wellbore damage, to the flow of fluids (gas or water) to the wellbore (GWPC 2009). The process is not new and has been a method for additional oil and gas recovery since the early 1900s; however, with the advancement of technology it is more commonly used.

Hydraulic fracturing is a process that uses high pressure pumps to pump fracturing fluid into a formation at a calculated, predetermined rate and pressure to generate fractures or cracks in the target formation. For shale development, fracture fluids are primarily water-based fluids mixed with additives which help the water to carry proppants into the fractures, which may be made up of sand, walnut hulls, or other small particles of materials. The proppant is needed to “prop” open the fractures once the pumping of fluids has stopped. Once the fracture has initiated, additional fluids are pumped into the wellbore to continue the

3449 development of the fracture and to carry the proppant deeper into the formation. The additional fluids are  
3450 needed to maintain the downhole pressure necessary to accommodate the increasing length of opened  
3451 fracture in the formation.

3452 Hydraulic fracturing of horizontal shale gas wells is performed in stages. Lateral lengths in horizontal  
3453 wells for development may range from 1,000 feet to more than 5,000 feet. Depending on the lengths of  
3454 the laterals, treatment of wells may be performed by isolating smaller portions of the lateral. The  
3455 fracturing of each portion of the lateral wellbore is called a stage. Stages are fractured sequentially  
3456 beginning with the section at the farthest end of the wellbore, moving up hole as each stage of the  
3457 treatment is completed until the entire lateral well has been stimulated.

3458 This process increases the flow rate and volume of reservoir fluids that move from the producing  
3459 formation into the wellbore. The fracturing fluid is typically more than 99 percent water and sand, with  
3460 small amounts of readily available chemical additives used to control the chemical and mechanical  
3461 properties of the water and sand mixture (see discussion about Hazardous and Solid Wastes below).  
3462 Because the fluid is composed mostly of water, large volumes of water are usually needed to perform  
3463 hydraulic fracturing. However, in some cases, water is recycled or produced water is used.

3464 Before operators or service companies perform a hydraulic fracturing treatment, a series of tests is  
3465 performed. These tests are designed to ensure that the well, casing, well equipment, and fracturing  
3466 equipment are in proper working order and will safely withstand the application of the fracture treatment  
3467 pressures and pump flow rates.

3468 To ensure that hydraulic fracturing is conducted in a safe and environmentally sound manner, the BLM  
3469 approves and regulates all drilling and completion operations, and related surface disturbance on Federal  
3470 public lands. Operators must submit Applications for Permit to Drill (APDs) to the agency. Prior to  
3471 approving an APD, a BLM OFO geologist identifies all potential subsurface formations that would be  
3472 penetrated by the wellbore. This includes all groundwater aquifers and any zones that would present  
3473 potential safety or health risks that may need special protection measures during drilling, or that may  
3474 require specific protective well construction measures.

3475 Once the geologic analysis is completed, the BLM reviews the company's proposed casing and cementing  
3476 programs to ensure the well construction design is adequate to protect the surface and subsurface  
3477 environment, including the potential risks identified by the geologist and all known or anticipated zones  
3478 with potential risks.

3479 During drilling, the BLM is on location during the casing and cementing of the ground water protective  
3480 surface casing and other critical casing and cementing intervals. Before hydraulic fracturing takes place,  
3481 all surface casing and some deeper, intermediate zones are required to be cemented from the bottom of  
3482 the cased hole to the surface. The cemented well is pressure tested to ensure there are no leaks and a  
3483 cement bond log is run to ensure the cement has bonded to the casing and the formation. If the fracturing  
3484 of the well is considered to be a "non-routine" fracture for the area, the BLM would always be onsite

during those operations as well as when abnormal conditions develop during the drilling or completion of a well.

**Figure 1. Typical Chemical Additives Used In Fracturing Fluids (GWPC 2009)**

Compound	Purpose	Common application
<b>Acids</b>	Helps dissolve minerals and initiate fissure in rock (pre-fracture)	Swimming pool cleaner
<b>Sodium Chloride</b>	Allows a delayed breakdown of the gel polymer chains	Table salt
<b>Polyacrylamide</b>	Minimizes the friction between fluid and pipe	Water treatment, soil conditioner
<b>Ethylene Glycol</b>	Prevents scale deposits in the pipe	Automotive anti-freeze, deicing agent, household cleaners
<b>Borate Salts</b>	Maintains fluid viscosity as temperature increases	Laundry detergent, hand soap, cosmetics
<b>Sodium/Potassium Carbonate</b>	Maintains effectiveness of other components, such as crosslinkers	Washing soda, detergent, soap, water softener, glass, ceramics
<b>Glutaraldehyde</b>	Eliminates bacteria in the water	Disinfectant, sterilization of medical and dental equipment
<b>Guar Gum</b>	Thickens the water to suspend the sand	Thickener in cosmetics, baked goods, ice cream, toothpaste, sauces
<b>Citric Acid</b>	Prevents precipitation of metal oxides	Food additive; food and beverages; lemon juice
<b>Isopropanol</b>	Used to increase the viscosity of the fracture fluid	Glass cleaner, antiperspirant, hair coloring

Chemicals serve many functions in hydraulic fracturing, from limiting the growth of bacteria to preventing corrosion of the well casing. Chemicals are needed to insure the hydraulic fracturing job is effective and efficient. The fracturing fluids used for shale stimulations consist primarily of water but also include a variety of additives. The number of chemical additives used in a typical fracture treatment varies depending on the conditions of the specific well being fractured. A typical fracture treatment will use very low concentrations of between 3 and 12 additive chemicals depending on the characteristics of the water and the shale formation being fractured. Each component serves a specific, engineered purpose. The predominant fluids currently being use for fracture treatments in the shale gas plays are water-based fracturing fluids mixed with friction-reducing additives, also known as slickwater (GWPC 2009).

The make-up of fracturing fluid varies from one geologic basin or formation to another. Because the make-up of each fracturing fluid varies to meet the specific needs of each area, there is no one-size-fits-all formula for the volumes for each additive. In classifying fracture fluids and their additives it is important to realize that service companies that provide these additives have developed a number of compounds

with similar functional properties to be used for the same purpose in different well environments. The difference between additive formulations may be as small as a change in concentration of a specific compound (GWPC 2009).

Typically, the fracturing fluids consist of about 99 percent water and sand and about 1 percent chemical additives. The chemical additives are essential to the process of releasing gas trapped in shale rock and other deep underground formation.

Some soils and geologic formations contain low levels of radioactive material. This naturally occurring radioactive material (NORM) emits low levels of radiation, to which everyone is exposed on a daily basis. When NORM is associated with oil and natural gas production, it begins as small amounts of uranium and thorium within the rock. These elements, along with some of their decay elements, notably radium<sub>226</sub> and radium<sub>228</sub>, can be brought to the surface in drill cuttings and produced water. Radon<sub>222</sub>, a gaseous decay element of radium, can come to the surface along with the shale gas. When NORM is brought to the surface, it remains in the rock pieces of the drill cuttings, remains in solution with produced water, or, under certain conditions, precipitates out in scales or sludges. The radiation is weak and cannot penetrate dense materials such as the steel used in pipes and tanks.

## 6.5 Production Operations

Production equipment used during the life of the well may include a 3-phase separator-dehydrator; flow-lines; a meter run; tanks for condensate, produced oil, and water; and heater treater. A pump jack may be required if the back pressure of the well is too high. Production facilities are arranged to facilitate safety and maximize reclamation opportunities. All permanent above-ground structures not subject to safety considerations are painted a standard BLM or company color or as landowner specified.

Workovers may be performed multiple times over the life of the well. Because gas production usually declines over the years, operators perform workover operations which involve cleaning, repairing and maintaining the well for the purposes of increasing or restoring production.

## 6.6 Hazardous or Solid Wastes Associated with Oil and Gas Development

Anticipated use or produced hazardous materials during the development may come from drilling materials; cementing and plugging materials; HF materials; production products (natural gas, condensates, produced water); fuels and lubricants; pipeline materials; combustion emissions; and

3534 miscellaneous materials. Appendix 1, Table 1 includes some of the common wastes (hazardous and non-  
 3535 hazardous) that are produced during oil and gas development.

3536 **Appendix 5, Table A5.1. Common wastes produced during oil and gas development.**

Phase	Waste
Construction	<ul style="list-style-type: none"> <li>Domestic wastes (i.e. food scraps, paper, etc.)</li> <li>Excess construction materials</li> <li>Used lubricating oils</li> <li>Solvents</li> <li>Woody debris</li> <li>Paints</li> <li>Sewage</li> </ul>
Drilling	<ul style="list-style-type: none"> <li>Drilling muds, including additives (i.e. chromate and barite) and cuttings</li> <li>Well drilling, completion, workover, and stimulation fluids (i.e. oil derivatives such as polycyclic aromatic hydrocarbons (PAHs), spilled chemicals, suspended and dissolved solids, phenols, cadmium, chromium, copper, lead, mercury, nickel)</li> <li>Equipment, power unit and transport maintenance wastes (i.e. batteries; used filters, lubricants, oil, tires, hoses, hydraulic fluids; paints; solvents)</li> <li>Fuel and chemical storage drums and containers</li> <li>Cementing wastes</li> <li>Production testing wastes</li> <li>Excess construction materials</li> <li>Scrap metal</li> <li>Sewage</li> <li>Rigwash</li> <li>Excess drilling chemicals</li> <li>Processed water</li> <li>Contaminated soil</li> <li>Domestic wastes</li> </ul>
HF	See below
Production	<ul style="list-style-type: none"> <li>Power unit and transport maintenance wastes (i.e. batteries; used filters, lubricants, filters, tires, hoses, coolants, antifreeze; paints; solvents, used parts)</li> <li>Discharged produced water</li> <li>Production chemicals</li> <li>Workover wastes (e.g. brines)</li> <li>Tank or pit bottoms</li> <li>Contaminated soil</li> <li>Scrap metal</li> </ul>
Abandonment/Reclamation	<ul style="list-style-type: none"> <li>Construction materials</li> <li>Decommissioned equipment</li> <li>Contaminated soil</li> <li>Insulating materials</li> <li>Sludge</li> </ul>

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3539 **Appendix 6: Federal, State or Local Permits, Licenses or Other Consultation Requirements**  
3540

3541 Purchasers of oil and gas leases are required to comply with all applicable Federal, state, and  
3542 local laws and regulations, including obtaining all necessary permits required should lease  
3543 development occur.

3544 The Resource Conservation and Recovery Act (RCRA) of 1976 (26) established a  
3545 comprehensive program for managing hazardous wastes from the time they are produced until  
3546 their disposal. U.S. Environmental Protection Agency (EPA) regulations define solid wastes as  
3547 any “discarded materials” subject to a number of exclusions. On July 6, 1988, EPA determined  
3548 that oil and gas exploration, development and production wastes would not be regulated as  
3549 hazardous wastes under RCRA.

3550 The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of  
3551 1980 (27) deals with the release of hazardous substances (spillage, leaking, dumping,  
3552 accumulation, etc.) or threat of a release of hazardous substances into the environment. Despite  
3553 many oil and gas constituent wastes being exempt from hazardous waste regulations, certain  
3554 RCRA-exempt contaminants could be subject to regulations as hazardous substances under  
3555 CERCLA. Civil and criminal penalties may be imposed if the hazardous waste is not managed  
3556 in a safe manner and according to regulations. The State of New Mexico Oil Conservation  
3557 Division (NMOCD) administers hazardous waste regulations for oil and gas activities in New  
3558 Mexico.

3559 The professional opinion of BLM biologists, using BLM inventory and monitoring data, is that  
3560 no federally listed threatened, endangered, or proposed species would be adversely affected by  
3561 sale of the lease parcels. Effects of oil and gas leasing and development on threatened or  
3562 endangered species were analyzed in Section 7 consultation (Cons. # 2-22-96-F-128 and Cons.  
3563 #22420-2007-TA-0033). No new information has been uncovered which would change that  
3564 analysis. Additional review and analysis would occur when site specific proposals for  
3565 development are received.

3566 Federal regulations and policies require the BLM to make its public land and resources available  
3567 on the basis of the principle of multiple use. At the same time, it is BLM policy to conserve  
3568 special status species and their habitats, and to ensure that actions authorized by the BLM do not  
3569 contribute to the need for the species to become listed as threatened or endangered by the  
3570 USFWS.

3571 Compliance with responsibilities under Section 106 of the National Historic Preservation Act is  
3572 achieved by following the Protocol Agreement between New Mexico Bureau of Land  
3573 Management and New Mexico State Historic Preservation Officer (Protocol Agreement), which  
3574 is authorized by the National Programmatic Agreement between BLM, the Advisory Council on  
3575 Historic Preservation, and the National Conference of State Historic Preservation Officers, and  
3576 other applicable BLM handbooks. A review of draft parcel locations was performed by the Rio  
3577 Puerco Field Office to address the potential for areas of concern to be present [Report NM-110-

3578 2013(III)A]. The cultural section in Affected Environment analysis portion of this EA describes  
3579 the general findings. It is, however, the responsibility of the leasee, or their designated  
3580 consultants, to understand and implement all of the requirements of the National Historic  
3581 Preservation Act and other pertinent legislation with regard to the management of cultural  
3582 resources within their respective Areas of Potential Effect (APE). This responsibility includes  
3583 the assumption of all costs related to compliance work and any mitigation issues that might arise  
3584 through avoidance, relocation, or the implementation of other remedial actions.

3585 Under Instruction Memorandum NM-2005-037 (13), consultation with Native American tribes to  
3586 identify traditional cultural properties and sacred sites takes place when the resource  
3587 management plan (RMP) is formulated or updated. If the RMP has not been updated, the Field  
3588 Office determines whether Native American consultation has been sufficient. The Rio Puerco  
3589 Field Office has determined that previous Native American consultation for this lease sale was  
3590 not sufficient and consultation with the appropriate tribes was initiated by registered mail on  
3591 April 3, 2013. One comment was received, and no sensitive properties are known to exist within  
3592 the proposed lease parcels.

3593 If responses are received, BLM cultural resources staff will discuss the information or issues of  
3594 concern with the Native American representatives to determine if all or portions of a parcel need  
3595 to be withdrawn from the sale, or if special requirements need to be attached as lease  
3596 stipulations.

3597 Compliance with the provisions of the 2009 Paleontological Resources Protection Act (PRPA;  
3598 Public Law 111-011) requires that the Department of the Interior consider the potential impacts  
3599 of development plans on significant fossil resources and allow for the implementation of  
3600 mitigation measures where necessary. Initial compliance is an internal process where the  
3601 potential for significant paleontological resources to be present is established by a review of the  
3602 Potential Fossil Yield Classification System (PFYC) for the Area of Potential Effects (APE).  
3603 Numerical ranking of the associated geological formations under the PFYC system in terms of  
3604 fossil potential dictates the direction of additional compliance measures. These may range from  
3605 a determination of no effect to the requirement that a paleontological survey be conducted by  
3606 appropriate specialists and that further action adheres to any subsequent recommendations.

3607 In Section 1835 of the Energy Policy Act of 2005 (43 U.S.C. 15801), Congress directed the  
3608 Secretary of the Interior to review current policies and practices with respect to management of  
3609 Federal subsurface oil and gas development activities and their effects on the privately owned  
3610 surface. The Split Estate Report, submitted in December 2006, documents the findings resulting  
3611 from consultation on the split estate issue with affected private surface owners, the oil and gas  
3612 industry, and other interested parties.

3613 In 2007, the Legislature of the State of New Mexico passed the Surface Owners Protection Act.  
3614 This Act requires operators to provide the surface owner notice at least five business days prior  
3615 to initial entry upon the land for activities that do not disturb the surface; and provide notice at  
3616 least 30 days prior to conducting actual oil and gas operations. At the New Mexico Federal

3617 Competitive Oil and Gas Lease Sale conducted on October 17, 2007, the BLM announced the  
3618 implementation of this policy. Included in this policy is the implementation of a Notice to  
3619 Lessees (NTL), a requirement of lessees and operators of onshore federal oil and gas leases  
3620 within the State of New Mexico to provide the BLM with the names and addresses of the surface  
3621 owners of those lands where the Federal government is not the surface owner, not including  
3622 lands where another federal agency manages the surface.

3623 The NMSO would then contact the surface owners and notify them of the expression of interest  
3624 and the date the oil and gas rights would be offered for competitive bidding. The BLM would  
3625 provide the surface owners with its website address so they may obtain additional information  
3626 related to the oil and gas leasing process, the imposition of any stipulations on that lease parcel,  
3627 federal and state regulations, and best management practices. The surface owners may elect to  
3628 protest the leasing of the minerals underlying their surface.

3629 If the BLM receives a protest, the parcel would remain on the lease sale. However, the BLM  
3630 would resolve any protest prior to issuing an oil and gas lease for that parcel. If the protest is  
3631 upheld, the BLM would return the payments received from the successful bidder for that parcel.  
3632 After the lease sale has occurred, the BLM would post the results on its website and the surface  
3633 owner may access the website to learn the results of the lease sale.

3634

3635 **APPENDIX 7: Relevant Table Listing**

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3637 **Table A7.1. Livestock Grazing Table**

PARCEL NO	ACRES	ALLOT NO	ALLOT NAME	Total allotment acres	Acres In Parcel	Percent of allotment in parcel
72	2005.95	00009	Horn Arroyo	4,741.4	1,255.48	26.4%
72	2005.95	00004	Starr Community	16,159.7	740.64	4.58%
72	2005.95	06023	Star Lake Community	129,773	.88	0.0006%
73	2080	00009	Horn Arroyo	4,741.4	953.18	20.1%
73	2080	06023	Star Lake Community	129,773	1.07	0.0008%
73	2080	00075	Valle Chamisa	3,525.67	1120	31.77%
74	792.92	06023	Star Lake Community	129,773	792.54	0.61%
75	640	06023	Star Lake Community	129,773	639.27	0.49%
76	1424.62	06023	Star Lake Community	129,773	1424.75	1.09%
77	2560	00023	Eagle Mesa	15,695	1,912.54	12.18%
77	2560	00075	Valle Chamisa	3,525.67	636.62	18.05%
78	1280	06023	Star Lake Community	129,773	1277.4	0.98%
79	800	06023	Star Lake Community	129,773	798.98	0.61%

PARCEL NO	ACRES	ALLOT NO	ALLOT NAME	Total allotment acres	Acres In Parcel	Percent of allotment in parcel
80	2041.68	00001	Continental Divide	8,542.68	1,260.57	14.75%
80	2041.68	00068	South Divide Community	3,179.37	670.03	21.07%
81	2459.04	00001	Continental Divide	8,542.68	1,832.54	21.45%
81	2459.04	00068	South Divide Community	3,179.37	580.46	18.25%
82	2433.02	00001	Continental Divide	8,542.68	2,433.16	28.48%
83	1680	00068	South Divide Community	3,179.37	1,013.80	31.88%
83	1680	00004	Starr Community	16,159.7	629.06	3.89%
84	1923.76	00001	Continental Divide	8,542.68	2.37	0.027%
84	1923.76	00003	Pelon Community	7,689.19	951.39	12.37%
84	1923.76	00004	Starr Community	16,159.7	1,600.56	9.90%
85	1280	00004	Starr Community	16,159.7	1,261.97	7.80%
86	480	00004	Starr Community	16,159.7	477.47	2.95%
87	1680	00004	Starr Community	16,159.7	1,668.44	10.32%

PARCEL NO	ACRES	ALLOT NO	ALLOT NAME	Total allotment acres	Acres In Parcel	Percent of allotment in parcel
88	961.88	00003	Pelon Community	7,689.19	951.39	12.37%
92	1279.84	06015	Counselor Community	100,734.13	953.57	0.93%
92	1279.84	00003	Pelon Community	7,689.19	6.75	0.08%
92	1279.84	00004	Starr Community	16,159.7	396.07	2.44%
93	320	06015	Counselor Community	100,734.13	316.79	0.31%
94	161.06	06015	Counselor Community	100,734.13	158.23	0.15%
95	958.2	06015	Counselor Community	100,734.13	937.41	0.93%
96	800	06015	Counselor Community	100,734.13	787.62	0.78%
97	1280	06015	Counselor Community	100,734.13	633.45	0.62%
97	1280	00003	Pelon Community	7,689.19	707.65	9.2%
98	1920	00003	Pelon Community	7,689.19	1261.41	16.4%
98	1920	00004	Starr Community	16,159.7	629.91	3.89%
99	1440.4	06015	Counselor Community	100,734.13	1421.43	1.41%
100	2400	00003	Pelon Community	7,689.19	2367.16	30.78%

PARCEL NO	ACRES	ALLOT NO	ALLOT NAME	Total allotment acres	Acres In Parcel	Percent of allotment in parcel
100	2400	00004	Starr Community	16,159.7	2.70	0.01%
101	1280	06022	Casuaus Brothers, Duran	4,117.84	628.88	15.27%
101	1280	06015	Counselor Community	100,734.13	2.08	0.002%
101	1280	00003	Pelon Community	7,689.19	631.64	8.21%
102	1280	06022	Casuaus Brothers, Duran	4,117.84	1142.71	27.75%
102	1160	06015	Counselor Community	100,734.13	1.74	0.001%
103	640	06022	Casuaus Brothers, Duran	4,117.84	632.36	15.35%
104	640	00003	Pelon Community	7,689.19	32.02	8.21%